TRUE GEOTHERMAL ENERGY COMPANY

CENTRAL PACIFIC PLAZA

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December 19, 1995

Manabu Tagomori, P.E.
Chief Engineer
Water and Land Development
DEPARTMENT OF LAND AND NATURAL RESOURCES
State of Hawaii
Kalanimoku Building
1155 Punchbowl Street, Room 227
Honolulu, HI 96813

RE: ENVIRONMENTAL REVIEW ON DRILL SITE AT KMERZ

Dear Mr. Tagomori:

Enclosed for your review and information is a copy concerning a report of an environmental review conducted by Brewer Environmental Inc. on the KMERZ drill site. The review was conducted in order to affirm that the KMERZ location is free of contamination and jeopardy from geothermal operations conducted thereon. The report is being forwarded to you for your own informational purposes.

We would appreciate any comments you may have in regard to the tests and conclusions contained in the report. The work in the report was conducted under the coordination of Renee Taylor, the Environmental Director of the True Companies.

I will be pleased to meet with you at your convenience, regarding any questions or comments you may have about the report. Thank you for your attention and consideration in this matter.

Very truly yours,

TRUE GEOTHERMAL ENERGY COMPANY

Allan G. Kawada

Enclosures

AGK/lk/1

C:\WK\LTR.020

ENVIRONMENTAL SITE ASSESSMENT REPORT

True Geothermal Energy Company
Drill Site of Geothermal Well KA-1
Puna, Hawaii

BES Job #3843

December 15, 1995

Latitude: 19°26′ 30″ N
Longitude: 155°00′ W

Prepared By:

Brewer Environmental Services
of
Brewer Environmental Industries

A Report Prepared For:

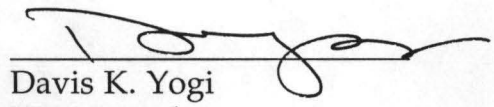
Privileged and Confidential

Ms. Renee Taylor
Environmental Coordinator
True Geothermal Energy Company
P.O. Drawer 2360
Casper, Wyoming 82602

ENVIRONMENTAL SITE ASSESSMENT REPORT

TRUE GEOTHERMAL ENERGY COMPANY
DRILL SITE OF GEOTHERMAL WELL KA-1
PUNA, HAWAII

BES Job No. 3843
by



Davis K. Yogi
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December 15, 1995

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1.0 INTRODUCTION

Brewer Environmental Services (BES) was retained by True Geothermal Energy Company (True) to perform a modified environmental site assessment at the drilling site of True Geothermal Well KA-1 in Puna, Hawaii (Figure 1). True leased the drill site from Campbell Estate (the fee landowner) for the development of geothermal energy and began active geothermal well development in 1989. During 1991, True discontinued their well development operations and removed most of the drilling equipment and other appurtenance from the site.

The objective of this modified environmental site assessment was to sample and evaluate the presence of hazardous substances that may be present aboveground and in the shallow subsurface soil at the site, as related to the past use and storage of equipment and materials used to drill and complete the well. This report presents the procedures and findings of the assessment and discusses the potential for significant subsurface soil and/or groundwater impacts due to the past use of potentially hazardous substances at the site.

2.0 SCOPE OF WORK

The scope of work used to accomplish the objective consisted of the following tasks:

- Perform a reconnaissance of the drilling site to: 1) note the current presence of hazardous materials; 2) observe visual signs of surface impact due to the past use of hazardous materials and petroleum products; and 3) to interview individuals with knowledge of the past use of the site, including fueling practices and maintenance of mobile equipment with petroleum products;

- Collect soil samples from the area formerly occupied by a 13,000-gallon diesel aboveground storage tank (AST) used to power the drill rig and collect one soil sample from the area formerly occupied by a 500-gallon diesel AST used to fill third party vehicles;

- Collect one composite sample of the drilling mud/cuttings inadvertently placed immediately north of the mud/cuttings pit; collect one sample of the soil comprising the western portion of the access road where mud/cuttings were incorporated into the road surface; and collect one background sample of soil comprising the eastern portion of the access road where drilling mud/cuttings had not been incorporated;

- Laboratory analysis of the soil samples collected from the areas formerly occupied by aboveground diesel ASTs for TPH by modified EPA Method 8015 and laboratory analysis of the drilling mud/cuttings samples for pH and RCRA metals using totals methods;

- Review of Department of Health (DOH) water sample laboratory data from nearby drinking water wells to assess the potential impact to nearby drinking water wells, as a result of the completion of Well KA-1; and

- Review of pertinent, available documents and maps regarding local geologic/ hydrogeologic conditions and review of applicable government regulations pertaining to the hazardous substances used in the well drilling operation.

It was not within the scope of this report to: 1) describe the details of the drilling operation; 2) describe the exact use and location of the various pieces of equipment; 3) describe the supplies needed to drill the well; or 4) review whether past or current practices met past or current permit conditions issued by the State of Hawaii.

3.0 SITE LOCATION AND LAND USE

The site is located in the southeastern part of the island of Hawaii approximately 20 miles east of Kilauea Volcano (Figure 1). Topographic map coverage of the site is provided by the United States Geological Survey (USGS) Kalalua and Pahoa South, Hawaii 7.5 minute quadrangles. The KA-1 well development was sited on approximately 8 acres in the southeastern portion of the Puna Forest Reserve (Figure 1.) The site is located on Campbell Estate property (TMK 1-2-10, portion 1, 2, and 3) and is part of the 27,000 acres that True leased from the Campbell Estate. Of the total 27,000 acres, 9,100 acres lies in the State of Hawaii designated geothermal sub-zone which is located in the east rift zone of the Kilauea Volcano. The elevation of the site is approximately 1,500 feet above sea level. The nearest surface water is the Pacific Ocean which is approximately 5 miles to the southeast.

Land surrounding the site consists of undeveloped, dense tropical forest. The nearest residence is more than two miles to the northeast of Well KA-1. The distance from the Campbell Estate property gate entrance to the well is approximately 2.5 miles. The access road leading to the well site is composed of sandy soil and gravel to accommodate vehicle travel (Photograph 1). The drill site is a graded cut and fill construction using naturally occurring volcanic material. The surface of the site was

covered with cinder to achieve a suitably level site for drilling operations.

During BES's visit on March 1, 1995, the site was observed to have been cleared of most drilling appurtenances, with the exception of three equipment storage facilities and several pieces of mobile equipment. The wellhead is located in a concrete cellar in the western portion of the project area.

4.0 GEOLOGY AND HYDROGEOLOGY

4.1 GEOLOGY

The following discussion of the geology and hydrogeology of the site is primarily based on a review of U.S. Geological Survey open file report 93-82 by K. J. Takasaki, "Ground Water in Kilauea Volcano and Adjacent Areas of Mauna Loa Volcano, Island of Hawaii" and identification of the site location on the above noted USGS topographic maps.

Regionally, well KA-1 is located along the lower slopes of the east rift zone of the Kilauea Volcano. (Figure 1). Within the east rift zone, basaltic rock of the Kilauea has been intruded by dense dike rock. By definition, rift zones are elongated areas of fissures where magma consolidates to form dike rock which is typically more dense than the rock through which it intrudes (Takasaki, 1993). Along the lower slopes of the east rift zone, data presented by Takasaki (1993) indicate that the number of dikes intruded into the older lava flows of the Kilauea are sparse at shallow depths and that the number of dikes increase with depth. Takasaki does not define the depths that he considers to be shallow or deep.

Based on soil sample collection activities performed at the site by BES in March 1995, reddish brown soil consisting of sand-sized to pebble-sized volcanic rock is present from the surface to approximately 0.5 feet. Hard, basaltic rock, which could not be penetrated with a geology hammer, was encountered beneath the looser surficial soil or cinder. True personnel indicated that the hard, basaltic rock encountered one foot below the surface consisted of volcanic boulders and rocks generated by site leveling and grading activities.

4.2 HYDROGEOLOGY

Rock types and geologic structures predominant in the areas of the Kilauea Volcano largely determine the occurrence and movement of groundwater. Along the lower

slopes of the east rift zone where the subject site is located, Takasaki (1993) indicates that there is a lack of dikes at shallow depths and as a result, it is unlikely that groundwater is impounded at altitudes substantially above sea level. This statement suggests that no zones of perched groundwater are present at or in the vicinity of the site.

Takasaki (1993) reports that groundwater levels in the lower slopes of the east rift zone of Kilauea are only a few feet above sea level and are about the same altitude as water levels in adjacent basal water bodies outside of the rift zone. In addition, data presented in the Takasaki (1993) report indicated that groundwater was approximately 10 feet above sea level in two wells located within the rift zone approximately 3 to 5 miles east-northeast of site. Based on the above information, the location of site along the lower slope of the east rift zone, and a site elevation of 1,500 feet above sea level, groundwater probably occurs approximately 1,490 feet below surface grade at the location of well KA-1.

The direction of groundwater flow in the rift zones generally is along strike of the dikes or along the long axis of the rift zones (Takasaki, 1993). This information suggests that groundwater beneath the subject site flows to the northeast. Generally, rift zones act as hydraulic barriers which limit the amount of groundwater moving into and out of the rift zone; however, Takasaki (1993) reports that there is an occurrence of heated basal water south of the lower east rift zone of Kilauea which indicates the movement of large quantities of geothermally heated groundwater southward from the east rift zone.

Groundwater beneath the site and in the east rift zone is geothermally influenced. No records were found of any drinking water wells within the east rift zone during BES' record search at the Department of Health-Safe Drinking Water Branch. This is probably due to the naturally poor quality of geothermally influenced groundwater in the rift zone.

5.0 SITE RECONNAISSANCE

On March 1, 1995, Barry Temple of BES performed a reconnaissance of the drilling site to: 1) note the current presence of hazardous materials; 2) observe visual signs of surface impact due to the past use of hazardous materials and petroleum products; and 3) interview individuals with knowledge of the past use of the site, including the AST fueling practices or maintenance of mobile equipment with petroleum products. In addition, photographs were taken of important site features (Appendix A).

Ms. Renee Taylor of True was present at the drilling site during the site reconnaissance to provide information regarding the history of the geothermal well drilling operation and to identify the former locations where materials and equipment were used and stored during drilling. According to Ms. Taylor, True discontinued geothermal well development at the site in 1991. The drill rig and the majority of drilling appurtenances were also removed from the site in 1991.

During reconnaissance, the mud/cuttings pits were noted to be present. Remaining drilling appurtenances were observed in three separate areas of the site. Drill pipe, steel framing, a tanker truck, and an aboveground holding tank were present in the north-central portion of the site. In the south-central portion of site, steel sheds and a tent structure were observed. Several 55-gallon drums, reportedly holding oil, were observed on pallets in one steel shed and in the tent structure. Caustic soda in 100 lb. bags were noted in the tent structure. No significant spillage of oil or caustic soda was observed on the ground surface within the structures. A subsequent tour of the entire site was performed. No visual evidence of surface impact, such as staining or distressed vegetation, were observed at any area of the site.

Ms. Taylor indicated that True will remove remaining materials and equipment from the site in the near future.

6.0 SITE ASSESSMENT ACTIVITIES

6.1 DIESEL FUEL ABOVEGROUND STORAGE TANKS

6.1.1 Sample Collection and Laboratory Analysis

On March 1, 1995, soil samples were collected from the area formerly occupied by a 13,000-gallon diesel fuel aboveground storage tank (AST) used to power the drill rig (Figures 3 and 4). Basalt was encountered at a depth of less than one foot at all locations. Soil sample TS1-6 was collected from an approximate depth of 3 inches below ground surface (bgs). Upon noting that the sample possessed a strong diesel fuel odor, it was decided to preliminarily assess the vertical and lateral extent of soil with strong diesel odors in the immediate area. Subsequently, soil sample TS1-1 was collected directly beneath sample TS1-6 at approximately 6 inches bgs. Due to the hardness of basaltic rock encountered below the initial 6 inches, samples could not be collected from greater depths using a geology hammer. Regardless, diesel fuel odors were noted to dissipate significantly between the depths of collection. Subsequently,

the lateral extent of diesel-impacted soil in the area of the 13,000-gallon AST was assessed by collecting soil samples in various directions away from the location of the TS1 soil samples. Soil samples TS-4 through TS-9 were collected from 3 inches bgs (Figure 4).

On March 1, 1995, one soil sample (TS-3) was collected from the area formerly occupied by a 500-gallon aboveground diesel fuel storage tank used to fill third party vehicles (Figure 3). Soil sample TS-3 was collected at approximately 3 to 5 inches bgs.

Each soil sample collected in the vicinity of the diesel fuel ASTs was packed tightly into a 8-ounce, laboratory-supplied glass jar. The jars were capped with Teflon-lined lids, labeled, and placed into an ice-chilled cooler. Samples were air-shipped using chain-of-custody procedures to Analytical Technologies, Inc. in San Diego, CA for analysis.

Soil samples collected at the former locations of the diesel ASTs were analyzed for fuel hydrocarbons using modified EPA Method 8015. The laboratory results for the samples are summarized below in Table 1 and appear on Figure 4. The laboratory report with chain-of-custody documentation is presented in Appendix B.

Table 1
TPH Laboratory Results for Soil Samples Collected Beneath the 13,000 and 500-Gallon Diesel ASTs (EPA method 8015M)

SAMPLE ID	SAMPLE DEPTH	TPH (mg/kg)
TS1-6	3 inches	20,000
TS1-1	6 inches	1,700
TS-3	3 inches	15
TS-4	3 inches	2,100
TS-5	3 inches	590
TS-6	3 inches	1,400
TS-7	3 inches	440
TS-8	3 inches	2,200
TS-9	3 inches	300
DOH Action Level [1]		***50***

1 Department of Health Underground Storage Tank Technical Guidance Manual, August 1992, page 5-5.

6.1.2 Discussion of Findings - Diesel ASTs

In the area of the former 13,000-gallon diesel AST, laboratory results indicated that soil samples TS1-6, TS1-1, and TS-4 through TS-9 had TPH concentrations ranging from 300 to 20,000 ppm. PID readings ranged from 4.3 to 48.1 ppm.

At the former location of the 500-gallon diesel AST, soil sample TS-3 was reported to have had a TPH concentration of 15 ppm. No diesel fuel odors were noted in soil around the area during site reconnaissance.

The Department of Health (DOH) remedial action level for total petroleum hydrocarbons (TPH) is 50 ppm for soil matrix. This level is considered to be protective of human health and the environment at all sites in Hawaii (pg. 5-5, DOH Technical Guidance Manual for UST Closure and Release Response). In 1992, the DOH established recommended cleanup criteria for: benzene, toluene, and ethylbenzene (BTE); the polynuclear aromatic hydrocarbons (PAHs); and deleted the use of TPH as the clean up goal. However, it is common practice to use TPH as an indicator of whether a release has occurred and whether the release requires cleanup.

6.2 DRILLING MUD/CUTTINGS

6.2.1 Sample Collection and Laboratory Analysis

Drilling mud/well cuttings produced in drilling the geothermal well were placed in a lined pit directly southwest of well center (Figures 2 and 3). True personnel indicated that a relatively small volume (several cubic yards) of the mud and cuttings were inadvertently removed by an equipment operator, who placed the material into small piles adjacent to the northern end of the pit. In response, one sample was collected from each of the three piles observed adjacent to the mud pit on March 1, 1995. The three samples were field composited into one sample designated as TS-2 (Figure 3 and Photograph 2).

True personnel indicated that drilling mud/well cuttings produced in drilling the geothermal well were also spread on and incorporated into western portion of the 2.5 mile access road. The portion of the road in which cuttings were incorporated extends from the drill site to approximately one mile down the access road, toward the Campbell Estate property gate. Sample TS-10 was collected from the western portion of the access road in which mud and cuttings

were incorporated, approximately 0.25 miles from the drill site (Figure 3). For comparison, background sample TS-11 was collected from the eastern portion of the access road where no mud or cuttings had been incorporated. The location of background sample TS-11 was approximately 2.0 miles from the drill site or approximately 0.5 miles from the Campbell Estate property gate.

Each sample collected from the mud/cuttings piles and from the access road was packed tightly into an 8-ounce, laboratory-supplied glass jar. The jars were capped with Teflon-lined lids, labeled, and placed into an ice-chilled cooler. Samples were air-shipped using chain-of-custody procedures to Analytical Technologies, Inc. in San Diego, CA for laboratory analysis.

The samples collected from mud/cuttings piles and from the access road were analyzed for pH and the 8 RCRA metals by EPA approved laboratory methods. The laboratory results for the samples are summarized below in Table 2 and appear on Figure 3. The laboratory report and chain-of custody is presented in Appendix B.

Table 2
8 RCRA Metals (Totals) Laboratory Results for Mud/Cuttings Samples Collected Adjacent to the Pit and Along the Access Road (Mg/Kg)

SAMPLE ID	Method 6010 Silver (Ag)	Method 7060 Arsenic (As)	Method 6010 Barium (Ba)	Method 7131 Cadmium (Cd)	Method 6010 Chromium (Cr)	Method 7471 Mercury (Hg)	Method 6010 Lead (Pb)	Method 7740 Selenium (Se)	Method 9045 pH
TS2 Adjacent Cuttings	<1.0	<1.0	40.8	<0.5	47.5	<0.25	12.9	<1.0	8.6
TS10 (Access Road)	<1.0	<1.0	9.6	<0.5	4.1	<0.25	<1.5	<1.0	6.2
TS11 Background	<1.0	<1.0	5.3	<0.5	5.6	<0.25	<1.5	<1.0	6.3
EPA PRG[1] Residential Soil	**380**	**22**	**5300**	**38**	**210**	**23**	**400**	**380**	**--**
EPA PRG[1] Industrial Soil	**8500**	**Not listed**	**10,0000**	**850**	**1600**	**510**	**1000**	**8500**	**--**

1 Region IX Preliminary Remediation Goals (1995)

6.2.2 Discussion of Findings - Drilling Mud/Cuttings

In 1995, the Environmental Protection Agency (EPA) established Preliminary Remediation Goals (PRGs) for certain harmful elements found in residential and industrial soil (Appendix C). PRGs are single contaminant level goals which have been determined by the EPA to pose no risk. PRGs for each of the 8 RCRA metals analyzed for in the mud/cuttings and background samples are presented in Table 2 for comparison.

Laboratory results indicated mud/cuttings samples collected adjacent to the cuttings pit and from the access road had metals (8 RCRA) concentrations below the EPA established PRGs. Sample TS-2, the composite sample collected adjacent to the mud/cuttings pit, was laboratory-reported to have barium, chromium, and lead concentrations above those of background sample TS-11; however, the concentrations are well below the PRGs. Laboratory results indicate that sample TS-10, collected from the portion of the road where drilling mud/cuttings were incorporated, had metal concentrations similar to background sample TS-11, with the exception of barium. Samples TS-2, TS-10, and TS-11 had pH levels ranging from 6.2 to 8.6. These pH levels are interpreted to be relatively neutral and do not approach hazardous pH levels.

The solid wastes associated with the exploration or development of geothermal energy, including the drilling fluids, produced waters, and other wastes are excluded from the definition of hazardous waste [40 CFR part 261.4(b)(5)]. The State of Hawaii did not adopt administrative rules governing hazardous waste until May 17, 1994 (Title 11 Chapters 260, 261 ,262, 263, 264, 265, 266, 268, 270, 271, 279 and 280.); therefore, the law governing geothermal operations prior to 1994 was 40 CFR part 261.

7.0 NEARBY DRINKING WATER WELL REVIEW

BES reviewed laboratory data from the Department of Health-Safe Drinking Water Branch for drinking water wells near the site. Data from the drinking water wells is the best available information to assess if True's activities adversely impacted groundwater during the time period of well development. Drinking water wells are not known to be in the east rift zone where Well KA-1 is located. According to the Department of Land and Natural Resources Groundwater Index (1991), wells in the rift zone that are east of KA-1 are not used for drinking water. This is probably due to the naturally poor quality of the

groundwater inherent in the rift zone. Five drinking water wells were identified outside of the rift zone. Wells 2487-01 and 02 are located approximately 4 miles southeast of the site. Wells 2986-01 and 02 are located approximately 5 miles to the east-northeast and Well 3188-01 is located approximately 6 miles to the north-northeast (Figure 1).

The Safe Drinking Water Branch of the DOH monitors the quality of the well waters periodically for volatile organic compounds (VOCs), inorganic chemicals (including heavy metals), nitrite/nitrate, fluoride, EDB and DBCP, pesticides, and glyphosate. Tables 3, 4, and 5 summarize the analytical water results provided by the DOH for the subject drinking water wells. Based on the historic record of laboratory results provided by the DOH on the nearby drinking water wells, there is a low likelihood that the True geothermal well development activities adversely impacted the drinking water supply during the time period.

TABLE 3
Keauohana (Kalapana) Well 2487-01 and 02

Year	VOC Regulated compounds	Nitrate/ Nitrite	Inor-ganic	EDB DBCP	Carbamate Pesticides	Synthetic Organic	Glyphosate
1990	ND	No Report	No Report	ND	No Report	No Report	No Report
1991	ND	Nitrate .31 ppm	No Report	ND	ND	No Report	No Report
1992	ND	Nitrate .15 ppm	No Report	ND	No Report	No Report	No Report
1993	No Report	No Report	ND	ND	ND	ND	No Report
1994	ND	Nitrate .29 ppm	No Report	No Report	No Report	ND	No Report
1995	No Report	Nitrate .17 ppm	No Report	No Report	No Report	No Report	No Report

ND - non-detect

TABLE 4
Pahoa Well 2986-01 and 02

Year	VOC Regulated compounds	Nitrate Nitrite	Inorganic	EDB DBCP	Carba-mate Pesticides	Synthetic Organic	Glyphosate
1990	ND	No Report	No Report	ND	No Report	No Report	No Report
1991	ND	Nitrate .50 ppm	No Report	ND	No Report	No Report	No Report
1992	ND	Nitrate .30 ppm	No Report	No Report	No Report	No Report	No Report
1993	No Report	No Report	ND	ND	ND	ND	No Report
1994	ND	Nitrate .36 ppm	ND	No Report	No Report	ND	No Report
1995	No Report	Nitrate .28 ppm	ND	No Report	No Report	No Report	ND

ND - non-detect

TABLE 5
Keonepoko Nui Well 3188-01

Year	VOC Regulated compounds	Nitrate Nitrite	Inorganic	EDB DBCP	Carbamate Pesticides	Synthetic Organic	Glyphosate
1990	ND	No Report	No Report	ND	No Report	No Report	No Report
1991	ND	No Report	ND	No Report	No Report	No Report	No Report
1992	ND	No Report	ND	No Report	No Report	No Report	No Report
1993	No Report	No Report	ND	ND	ND	ND	No Report
1994	ND	Nitrate .38 ppm	No Report	No Report	No Report	ND	No Report
1995	No Report	Nitrate .28 ppm	No Report	No Report	No Report	No Report	ND

ND - non-detect

8.0 CONCLUSIONS

- Reconnaissance of the site indicated that the mud/cuttings pits, some drill pipe, other drilling appurtenances, and small structures housing several 55-gallon oil drums and 100 lb. bags of caustic soda remained at the site. The majority of drill equipment and appurtenances have been removed. True personnel indicated the remaining items will be dismantled and removed in the near future. No significant spillage of oil or caustic soda was observed on the ground surface within the structures. No visual evidence of surface impact, such as staining or distressed vegetation, were observed at any area of the site.

- In the vicinity of the former 13,000-gallon diesel AST, soil samples collected at 3 inches bgs had TPH concentrations ranging from 300 to 20,000 ppm. Directly beneath the soil sample with the 20,000 ppm concentration, TPH concentrations declined to 1,700 ppm at 6 inches bgs. The sharp decline in TPH at shallow depths suggests that the impact to soil is probably confined to shallow depths. In response, True personnel excavated the diesel impacted soil in the area of the former 13,000-gallon diesel AST to approximately 1.0 foot bgs; basalt was encountered at that depth throughout the over-excavation of the impacted area. Results of the release response activities are presented in a separate report.

- The soil sample (TS-3) collected beneath the former location of the 500-gallon diesel AST to assess potential impact in the area had a TPH concentration of 15 ppm. No diesel fuel odors were noted in soil in the area. This data indicates no significant impact to soil in the area, as a result of use by third party vehicles.

- Laboratory results indicated that mud/cutting samples collected adjacent to the cuttings pit and from the access road had metals (8 RCRA) concentrations (totals) below the EPA established Preliminary Remediation Goals (PRGs). The composite sample (TS-2) collected adjacent to the mud/cuttings pit had levels of barium, chromium, and lead above those of background sample TS-11; however, the concentrations are well below the PRGs. Laboratory results indicated that the sample collected from the portion of the road where drilling mud and cuttings were incorporated, had metal concentrations similar to that of background sample TS-11. Samples TS-2, TS-10, and TS-11 had pH levels ranging from 6.2 to 8.6. These pH levels are interpreted to be relatively

- The solid wastes associated with the exploration or development of geothermal energy including the drilling fluids, produced waters, and other wastes are excluded from the definition of hazardous waste [40 CFR part 261.4(b)(5)]. The State of Hawaii did not adopt administrative rules governing hazardous waste until May 17, 1994 (Title 11 Chapters 260, 261 ,262, 263, 264, 265, 266, 268, 270, 271, 279 and 280.) Therefore, the law governing geothermal operations prior to 1994 was 40 CFR part 261.

- Review of geologic/hydrologic information, indicates the site is located along the lower slope of the east rift zone of the Kilauea Volcano where basaltic rock of the Kilauea has been intruded by dense dike rock. Groundwater beneath the site and in the east rift zone is geothermally influenced and is not regarded as being of drinking water quality. Groundwater probably occurs approximately 1,490 feet below surface grade and flows to the northeast, along the axis of the rift zone. Generally, rift zones act as hydraulic barriers which limit the amount of groundwater moving into and out of the rift zone; however, Takasaki (1993) reports that there is an occurrence of heated basal water south of the lower east rift zone of Kilauea which indicates the movement of large quantities of geothermally heated groundwater southward from the east rift zone.

- Drinking water wells are not known to be located in the east rift zone. According to the Department of Land and Natural Resources Groundwater Index (1991), wells in the rift zone that are east of KA-1 are not used for drinking water. Five drinking water wells were identified outside of the rift zone, within 6 miles of the site. Based on the historic record of laboratory results provided by the DOH on the nearby drinking water wells, there is a low likelihood that the True geothermal well development activities adversely impacted the drinking water supply during the time period of well development activities.

9.0 REFERENCES

- Technical Guidance Manual for Underground Storage Tank Closure and Release Response, State of Hawaii, Department of Health, August 1992.
- Groundwater in Kilauea Volcano and Adjacent Areas of Mauna Loa Volcano, Island of Hawaii, Kiyoshi Takasaki, (1993)
- U.S. EPA Region IX Preliminary Remediation Goals (February 1, 1995)
- Groundwater Index and Summary, Department of Land and Natural Resources (1991)
- 40 CFR Part 261.
- Renee Taylor, True Geothermal, Personal Communication,
- Gary Dahl, True Geothermal, Personal Communication

FIGURES

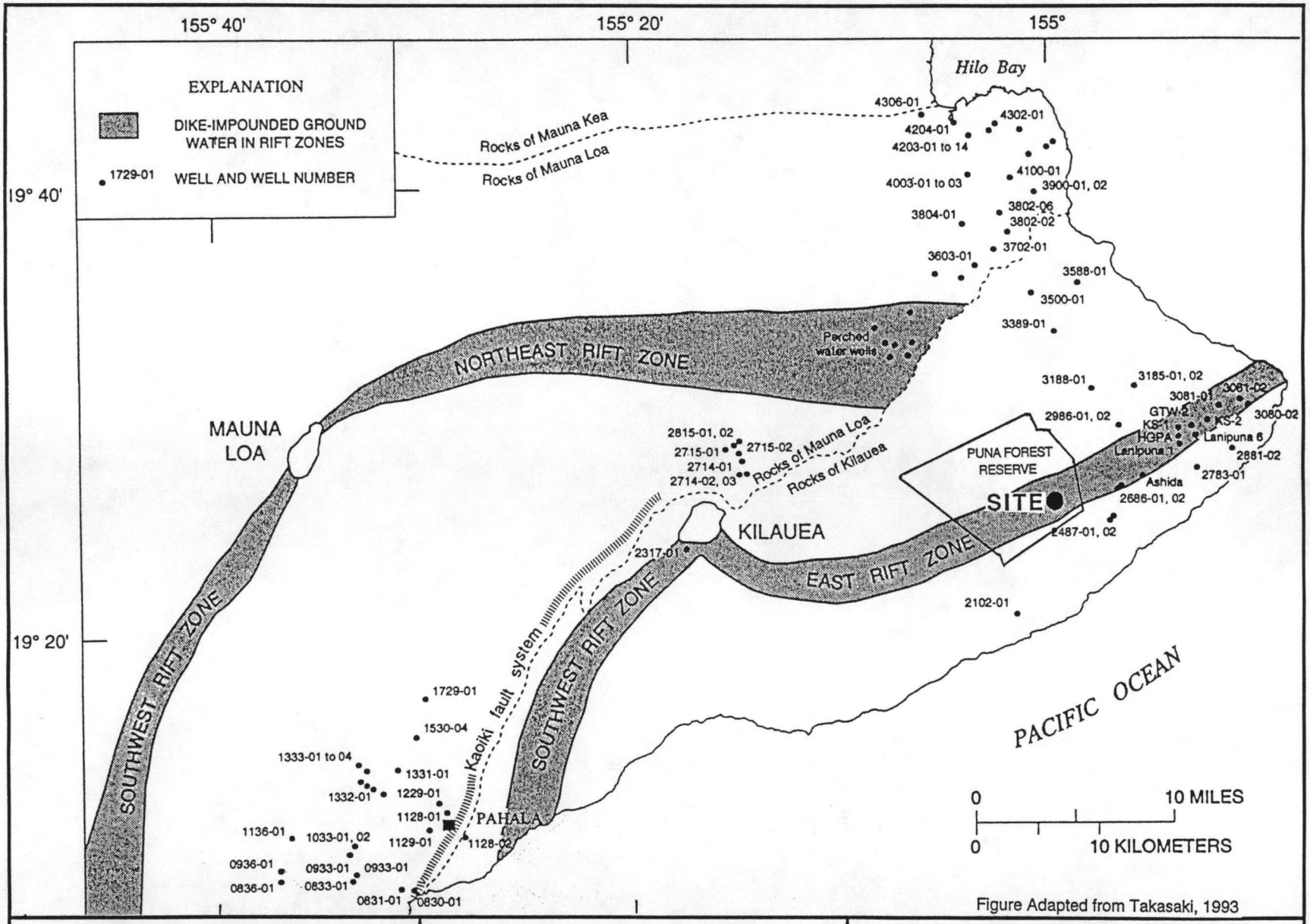
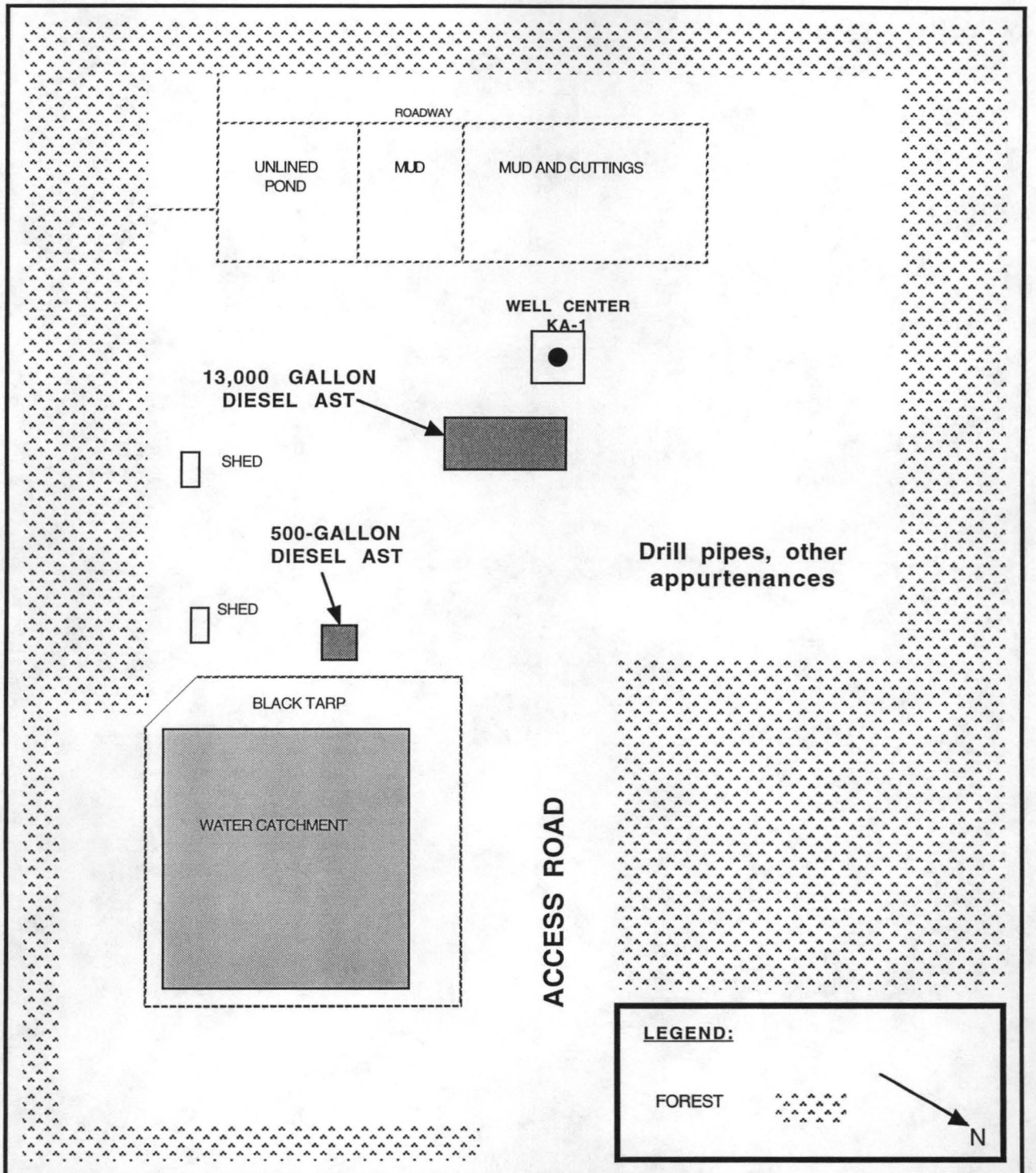
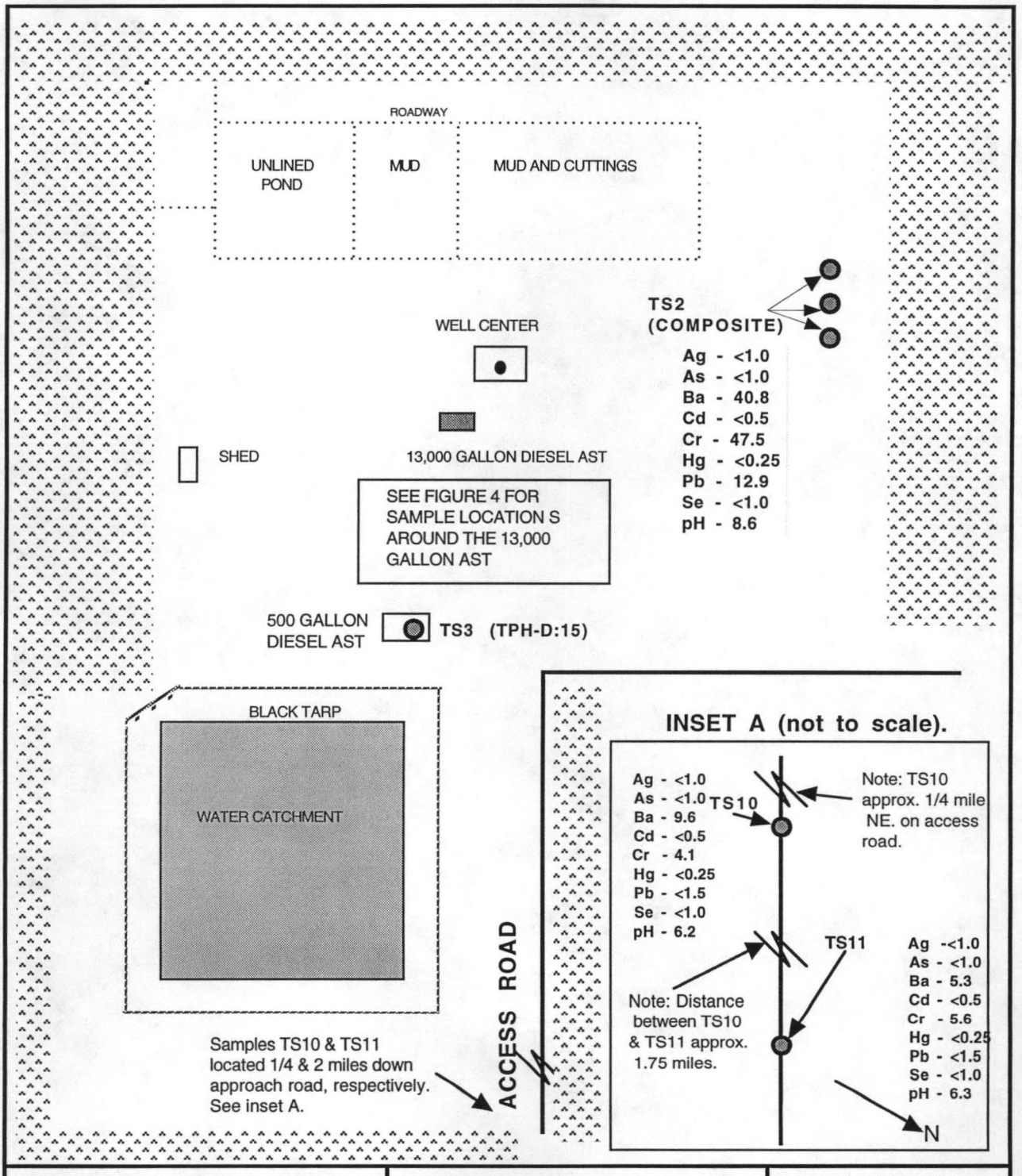


Figure Adapted from Takasaki, 1993

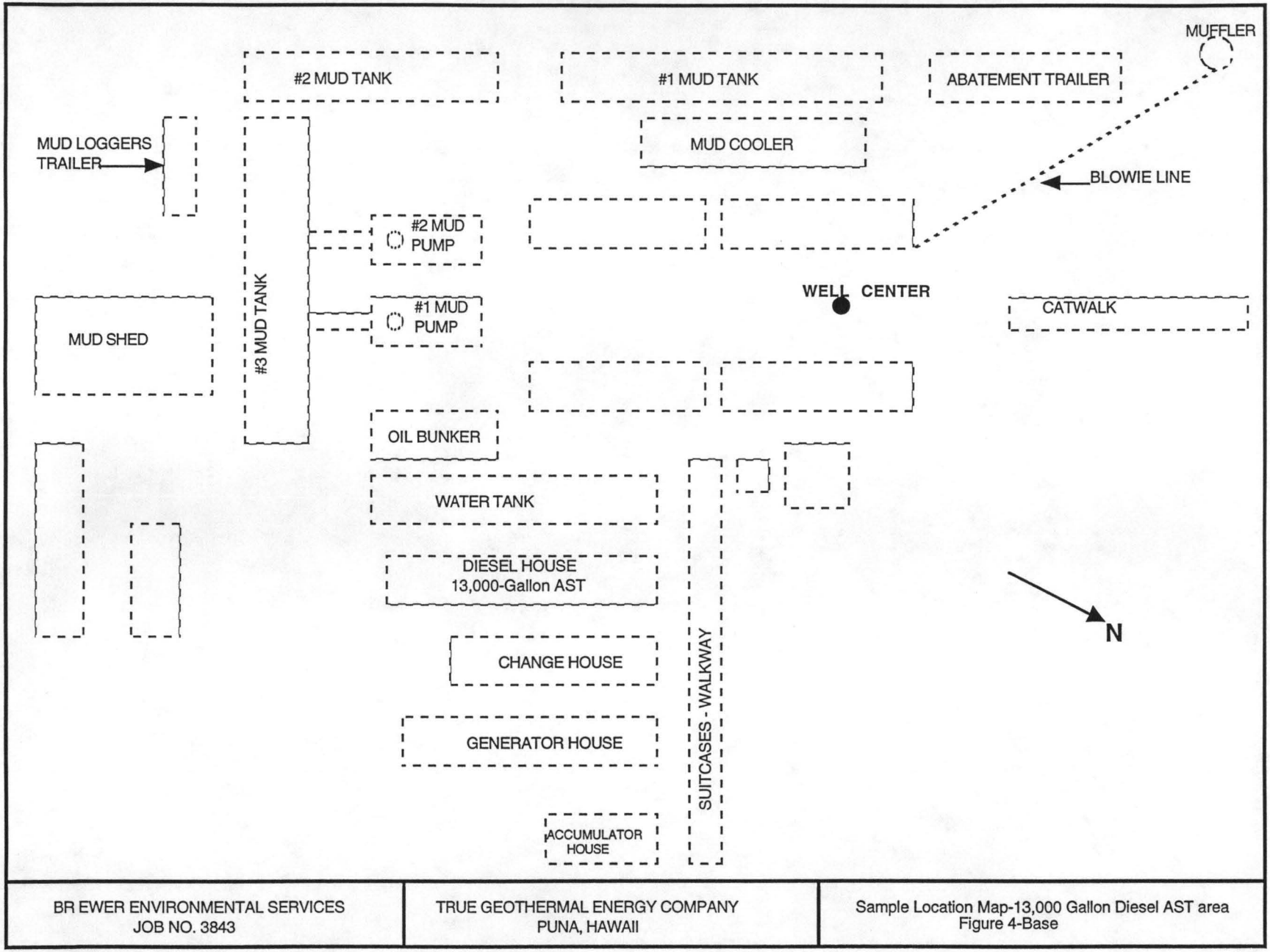
BR EWER ENVIRONMENTAL SERVICES JOB NO. 3843	TRUE GEOTHERMAL ENERGY COMPANY PUNA, HAWAII	SITE AND WATER WELL LOCATION MAP FIGURE 1



BREWER ENVIRONMENTAL SERVICES	TRUE GEOTHERMAL ENERGY COMPANY PUNA, HAWAII	SITE MAP NOT TO SCALE FIGURE 2
JOB NO. 3843		



BREWER ENVIRONMENTAL SERVICES	TRUE GEOTHERMAL ENERGY COMPANY PUNA, HAWAII	SAMPLE LOCATION AND RESULTS MAP NOT TO SCALE FIGURE 3
JOB NO. 3943		



BR EWER ENVIRONMENTAL SERVICES JOB NO. 3843	TRUE GEOTHERMAL ENERGY COMPANY PUNA, HAWAII	Sample Location Map-13,000 Gallon Diesel AST area Figure 4-Base

APPENDIX A

Photographs

Photograph 1

Road Leading to Site

Photograph 2

View of Sample TS-2, North of Mud Pits

Photograph 3

View of Sample TS-3, Former Location of 500-Gallon Diesel AST

Photograph 4

View of Sample TS1-6, Former location of 13,000-Gallon Diesel AST

Photograph 5

View of Sample Locations - Former location of 13,000-Gallon Diesel AST

APPENDIX B

Laboratory Reports

AnalyticalTechnologies, Inc. Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-9141

ATI I.D.: 503053

March 14, 1995

BREWER ENVIRONMENTAL INDUSTRIES, INC
401 WAIAKAMILO ROAD, SUITE 101
HONOLULU, HI 96817

Project Name: (NONE)
Project # : 3843

Attention: BARRY TEMPLE

Analytical Technologies, Inc. has received the following sample(s):

Date Received	Quantity	Matrix
March 03, 1995	12	SOIL

The sample(s) were analyzed with EPA methodology or equivalent methods as specified in the enclosed analytical schedule. The symbol for "less than" indicates a value below the reportable detection limit. If any flags appear next to the analytical data in this report, please see the attached list of flag definitions.

The results of these analyses and the quality control data are enclosed. Please note that the Sample Condition Upon Receipt Checklist is included at the end of this report.

JON M. BREWSTER
PROJECT MANAGER

for ALAN J. KLEINSCHMIDT
LABORATORY MANAGER

Analytical**Technologies,**Inc.

SAMPLE CROSS REFERENCE

Client : BREWER ENVIRONMENTAL INDUSTRIES, INC
Project # : 3843
Project Name: (NONE)

Report Date: March 14, 1995
ATI I.D. : 503053

ATI #	Client Description	Matrix	Date Collected
1	TS1-6''	SOIL	01-MAR-95
2	TS1-1'	SOIL	01-MAR-95
3	TS2	SOIL	01-MAR-95
4	TS3	SOIL	01-MAR-95
5	TS4	SOIL	01-MAR-95
6	TS5	SOIL	01-MAR-95
7	TS6	SOIL	01-MAR-95
8	TS7	SOIL	01-MAR-95
9	TS8	SOIL	01-MAR-95
10	TS9	SOIL	01-MAR-95
11	TS10	SOIL	01-MAR-95
12	TS11	SOIL	01-MAR-95

---TOTALS---

Matrix	# Samples
SOIL	12

ATI STANDARD DISPOSAL PRACTICE

The sample(s) from this project will be disposed of in twenty-one (21) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

ANALYTICAL SCHEDULE

Client : BREWER ENVIRONMENTAL INDUSTRIES, INC
Project # : 3843
Project Name: (NONE)

ATI I.D.: 503053

Analysis	Technique/Description
EPA 6010 (BARIUM)	INDUCTIVELY COUPLED ARGON PLASMA
EPA 6010 (CHROMIUM)	INDUCTIVELY COUPLED ARGON PLASMA
EPA 6010 (LEAD)	INDUCTIVELY COUPLED ARGON PLASMA
EPA 6010 (SILVER)	INDUCTIVELY COUPLED ARGON PLASMA
EPA 7060 (ARSENIC)	ATOMIC ABSORPTION/GRAPHITE FURNACE
EPA 7131 (CADMIUM)	ATOMIC ABSORPTION/GRAPHITE FURNACE
EPA 7471 (NON AQUEOUS MERCURY)	ATOMIC ABSORPTION/COLD VAPOR
EPA 7740 (SELENIUM)	ATOMIC ABSORPTION/GRAPHITE FURNACE
EPA 9045 (pH SOIL)	ELECTRODE
METHOD 7-2.2,METHODS OF SOIL ANALYSIS(% MOISTURE)	GRAVIMETRIC
MOD EPA 8015-CDOHS (FUEL HYDROCARBONS: C6-C24)	GC/FLAME IONIZATION DETECTOR

NOTE: ALL SAMPLE RESULTS WERE REPORTED IN DRY WEIGHT.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

Client : BREWER ENVIRONMENTAL INDUSTRIES, INC
Project # : 3843 ATI I.D.: 503053
Project Name: (NONE)

Sample #	Client ID	Matrix	Date Sampled	Date Received
1	TS1-6''	SOIL	01-MAR-95	03-MAR-95
2	TS1-1'	SOIL	01-MAR-95	03-MAR-95
3	TS2	SOIL	01-MAR-95	03-MAR-95
4	TS3	SOIL	01-MAR-95	03-MAR-95
5	TS4	SOIL	01-MAR-95	03-MAR-95

Parameter	Units	1	2	3	4	5
% MOISTURE	%	15.6	10.0	12.5	8.1	13.8
pH	UNITS	-	-	8.6	-	-

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

Client : BREWER ENVIRONMENTAL INDUSTRIES, INC
Project # : 3843 ATI I.D.: 503053
Project Name: (NONE)

Sample #	Client ID	Matrix	Date Sampled	Date Received
6	TS5	SOIL	01-MAR-95	03-MAR-95
7	TS6	SOIL	01-MAR-95	03-MAR-95
8	TS7	SOIL	01-MAR-95	03-MAR-95
9	TS8	SOIL	01-MAR-95	03-MAR-95
10	TS9	SOIL	01-MAR-95	03-MAR-95

Parameter	Units	6	7	8	9	10
% MOISTURE	%	12.6	14.7	11.5	13.3	9.2

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

Client : BREWER ENVIRONMENTAL INDUSTRIES, INC
Project # : 3843
Project Name: (NONE)

ATI I.D.: 503053

Sample #	Client ID	Matrix	Date Sampled	Date Received
11	TS10	SOIL	01-MAR-95	03-MAR-95
12	TS11	SOIL	01-MAR-95	03-MAR-95

Parameter	Units	11	12
% MOISTURE	%	12.2	14.1
pH	UNITS	6.2	6.3

GENERAL CHEMISTRY - QUALITY CONTROL

DUP/MS

Client : BREWER ENVIRONMENTAL INDUSTRIES, INC
Project # : 3843 ATI I.D. : 503053
Project Name: (NONE)

Parameters	REF I.D.	Units	Sample Result	Dup Result	RPD	Spiked Sample	Spike Conc	% Rec
% MOISTURE	503033-02	%	26.6	26.5	0	N/A	N/A	N/A
% MOISTURE	503053-03	%	12.5	11.3	10	N/A	N/A	N/A
pH	503053-12	UNITS	6.3	6.2	2	N/A	N/A	N/A

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Sample Result - Duplicate Result)*100/Average Result

Analytical Technologies, Inc.

METALS RESULTS

Client : BREWER ENVIRONMENTAL INDUSTRIES, INC
Project # : 3843 ATI I.D.: 503053
Project Name: (NONE)

Sample #	Client ID	Matrix	Date Sampled	Date Received
3	TS2	SOIL	01-MAR-95	03-MAR-95
11	TS10	SOIL	01-MAR-95	03-MAR-95
12	TS11	SOIL	01-MAR-95	03-MAR-95

Parameter	Units	3	11	12
SILVER	MG/KG	<1.0	<1.0	<1.0
ARSENIC	MG/KG	<1.0	<1.0	<1.0
BARIUM	MG/KG	40.8	9.6	5.3
CADMIUM	MG/KG	<0.5	<0.5	<0.5
CHROMIUM	MG/KG	47.5	4.1	5.6
MERCURY	MG/KG	<0.25	<0.25	<0.25
LEAD	MG/KG	12.9	<1.5	<1.5
SELENIUM	MG/KG	<1.0	<1.0	<1.0

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

DUP/MS

Client : BREWER ENVIRONMENTAL INDUSTRIES, INC
Project # : 3843 ATI I.D. : 503053
Project Name: (NONE)

Parameters	REF I.D.	Units	Sample Result	Dup Result	RPD	Spiked Sample	Spike Conc	% Rec
ARSENIC	503013-02	MG/KG	14.6	13.8	6	60.9	49.7	93
BARIUM	503033-01	MG/KG	436	432	1	559	130	95
CADMIUM	503013-02	MG/KG	8.0	7.6	5	51.5	49.7	88
CHROMIUM	503033-01	MG/KG	93.3	90.8	3	158	64.9	100@V
LEAD	503033-01	MG/KG	737	600	20	854	64.8	N/A*V
MERCURY	503053-03	MG/KG	<0.25	<0.25	0	1.08	0.98	110
SELENIUM	503013-02	MG/KG	4.3	3.6	18	30.9	29.8	89
SILVER	503033-01	MG/KG	1.6	1.2	29@R	55.1	64.8	83

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Sample Result - Duplicate Result)*100/Average Result

Analytical**Technologies,**Inc.

METALS - QUALITY CONTROL

BLANK SPIKE

Client : BREWER ENVIRONMENTAL INDUSTRIES, INC
Project # : 3843 ATI I.D. : 503053
Project Name: (NONE)

Parameters	Blank Spike ID#	Units	Blank Result	Spiked Sample	Spike Conc.	% Rec
ARSENIC	54978	MG/KG	<1.0	47.6	50.0	95
BARIUM	54971	MG/KG	<0.5	96.1	100	96
CADMIUM	54978	MG/KG	<0.5	46.1	50.0	92
CHROMIUM	54971	MG/KG	<0.5	46.7	50.0	93
LEAD	54971	MG/KG	<1.5	46.4	50.0	93
MERCURY	54972	MG/KG	<0.25	1.05	1.00	105
SELENIUM	54978	MG/KG	<1.0	27.5	30.0	92
SILVER	54971	MG/KG	<1.0	45.7	50.0	91

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Sample Result - Duplicate Result)*100/Average Result

GAS CHROMATOGRAPHY RESULTS

Test : MOD EPA 8015-CDOHS (FUEL HYDROCARBONS: C6-C24)
Client : BREWER ENVIRONMENTAL INDUSTRIES, INC ATI I.D. : 503053
Project # : 3843
Project Name: (NONE)

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
1	TS1-6''	SOIL	01-MAR-95	06-MAR-95	07-MAR-95	100.00
2	TS1-1'	SOIL	01-MAR-95	06-MAR-95	07-MAR-95	1.00
4	TS3	SOIL	01-MAR-95	06-MAR-95	07-MAR-95	1.00

Parameter	Units	1	2	4
FUEL HYDROCARBONS	MG/KG	20000	1700	15
HYDROCARBON RANGE		C10-C24	C10-C24+	C14-C24
HYDROCARBONS QUANTITATED USING		DIESEL	DIESEL	DIESEL
SURROGATES				
BIS(2-ETHYLHEXYL)PHTHALATE	%	N/A*K	96	99

GAS CHROMATOGRAPHY RESULTS

Test : MOD EPA 8015-CDOHS (FUEL HYDROCARBONS: C6-C24)
Client : BREWER ENVIRONMENTAL INDUSTRIES, INC ATI I.D. : 503053
Project # : 3843
Project Name: (NONE)

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
5	TS4	SOIL	01-MAR-95	06-MAR-95	07-MAR-95	1.00
6	TS5	SOIL	01-MAR-95	06-MAR-95	07-MAR-95	1.00
7	TS6	SOIL	01-MAR-95	06-MAR-95	07-MAR-95	1.00

Parameter	Units	5	6	7
FUEL HYDROCARBONS	MG/KG	2100	590	1400
HYDROCARBON RANGE		C10-C24+	C12-C24+	C10-C24+
HYDROCARBONS QUANTITATED USING		DIESEL	DIESEL	DIESEL
SURROGATES				
BIS(2-ETHYLHEXYL)PHTHALATE	%	92	86	97

GAS CHROMATOGRAPHY RESULTS

Test : MOD EPA 8015-CDOHS (FUEL HYDROCARBONS: C6-C24)
Client : BREWER ENVIRONMENTAL INDUSTRIES, INC ATI I.D. : 503053
Project # : 3843
Project Name: (NONE)

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
8	TS7	SOIL	01-MAR-95	06-MAR-95	07-MAR-95	1.00
9	TS8	SOIL	01-MAR-95	06-MAR-95	08-MAR-95	1.00
10	TS9	SOIL	01-MAR-95	06-MAR-95	08-MAR-95	1.00

Parameter	Units	8	9	10
FUEL HYDROCARBONS	MG/KG	440	2200	300
HYDROCARBON RANGE		C12-C24+	C10-C24+	C12-C24+
HYDROCARBONS QUANTITATED USING		DIESEL	DIESEL	DIESEL
SURROGATES				
BIS(2-ETHYLHEXYL)PHTHALATE	%	88	99	99

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - QUALITY CONTROL

REAGENT BLANK

Test : MOD EPA 8015-CDOHS (FUEL HYDROCARBONS)
Blank I.D. : 34573
Client : BREWER ENVIRONMENTAL INDUSTRIES, INC
Project # : 3843
Project Name: (NONE)

ATI I.D. : 503053
Date Extracted: 06-MAR-95
Date Analyzed : 06-MAR-95
Dil. Factor : 1.00

Parameters	Units	Results
FUEL HYDROCARBONS	MG/KG	<5.0
HYDROCARBON RANGE		C6-C14
HYDROCARBONS QUANTITATED USING		GASOLINE
SURROGATES		
BIS(2-ETHYLHEXYL)PHTHALATE	%	(Inc)

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - QUALITY CONTROL

MSMSD

Test : MOD EPA 8015-CDOHS (FUEL HYDROCARBONS)
MSMSD # : 73659
Client : BREWER ENVIRONMENTAL INDUSTRIES, INC

Project # : 3843
Project Name: (NONE)

ATI I.D. : 503053
Date Extracted: 06-MAR-95
Date Analyzed : 06-MAR-95
Sample Matrix : SOIL
REF I.D. : REAGENT SOIL

Parameters	Units	Sample Result	Conc Spike	Spiked Sample	% Rec	Dup Spike	Dup % Rec	RPD
FUEL HYDROCARBONS	MG/KG	<5.0	100	84	84	85	85	1

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Spiked Sample Result - Duplicate Spike Result)*100/Average Result

ANALYTICAL TECHNOLOGIES, INC.
SAN DIEGO
FLAGS

INORGANICS

FLAG	MESSAGE DESCRIPTION
B	ABSOLUTE VALUE OF ANALYTE CONCENTRATION IS < CRDL BUT ≥ THE IDL
BB	RESULT BETWEEN IDL AND LOQ
D	POST DIGESTION SPIKE FOR GFAA OUTSIDE LIMITS AFTER 1:25 DILUTION. SAMPLE REPORTED AT ORIGINAL CONCENTRATION.
E	ESTIMATED VALUE DUE TO INTERFERENCE
M	DUPLICATE INJECTION PRECISION NOT MET
N	SPIKED SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
S	REPORTED VALUE WAS DETERMINED BY METHOD OF STANDARD ADDITIONS
U	COMPOUND WAS ANALYZED FOR BUT NOT DETECTED
W	POST DIGESTION SPIKE OUT OF CONTROL LIMITS; SAMPLE ABSORBANCE < 50% OF SPIKE ABSORBANCE FOR GF/AA
X	ABSOLUTE VALUE OF ANALYTE CONCENTRATION IS LESS THAN 3 TIMES THE MDL
*	DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
+	CORRELATION COEFFICIENT FOR MSA IS LESS THAN 0.995
*H	RESULTS OUTSIDE OF LIMITS DUE TO SAMPLE MATRIX INTERFERENCE
*Q	INSUFFICIENT SAMPLE FOR ANALYSIS
*R	DATA IS NOT USABLE
*V	SAMPLE RESULT IS >4X SPIKED CONCENTRATION, THEREFORE SPIKE IS NOT DETECTABLE
*Y	RESULT NOT ATTAINABLE DUE TO SAMPLE MATRIX INTERFERENCE
@C	*VARIABLE MESSAGE*
@H	DETECTION LIMIT ELEVATED DUE TO MATRIX INTERFERENCE
@Q	DETECTION LIMIT ELEVATED DUE TO LIMITED SAMPLE FOR ANALYSIS
@R	RPD LIMIT IS 67% FOR INORGANIC RESULTS LESS THAN TEN TIMES THE REPORTING DETECTION LIMIT
@S	RPD: ONE RESULT ABOVE AND ONE RESULT BELOW REPORTING LIMIT (RL). RESULT ABOVE SHOULD BE < 5 TIMES RL TO BE IN CONTROL.
@V	PRE-DIGEST SPIKE OUT OF LIMITS. POST DIGESTION SPIKE YIELDED ACCEPTABLE RESULTS
@W	DETECTION LIMIT ELEVATED DUE TO REDUCED SAMPLE WEIGHT
@Y	ION BALANCE OUTSIDE OF ATI'S ACCEPTANCE LIMITS; REANALYSIS CONFIRMED ORIGINAL RESULT
@X	RESULTS VERIFIED BY REDIGESTION AND REANALYSIS

ANALYTICAL TECHNOLOGIES, INC.
SAN DIEGO
FLAGS

ORGANICS

FLAG	MESSAGE DESCRIPTION
A	A TIC IS A SUSPECTED ALDOL-CONDENSATION PRODUCT
B	ANALYTE FOUND IN THE ASSOCIATED REAGENT BLANK
C	PESTICIDE, WHERE THE IDENTIFICATION WAS CONFIRMED BY GC/MS
CO	THESE COMPOUNDS CO-ELUTE AND ARE QUANTITATED AS ONE PEAK
D	COMPOUND IDENTIFIED IN AN ANALYSIS AT SECONDARY DILUTION
E	ANALYTE AMOUNT EXCEEDS THE CALIBRATION RANGE
J	ESTIMATED VALUE
H	QUANTIFIED AS DIESEL BUT CHROMATOGRAPHIC PATTERN DOES NOT MATCH THAT OF DIESEL
K	QUANTIFIED AS KEROSENE BUT CHROMATOGRAPHIC PATTERN DOES NOT MATCH THAT OF KEROSENE
L	QUANTIFIED AS GASOLINE BUT CHROMATOGRAPHIC PATTERN DOES NOT MATCH THAT OF GASOLINE
N	PRESUMPTIVE EVIDENCE OF A COMPOUND
P	PESTICIDE/AROCLOR TARGET ANALYTE, WHERE THERE IS GREATER THAN 25% DIFFERENCE FOR DETECTED CONCENTRATION BETWEEN 2 GC COLUMNS
TR	COMPOUND DETECTED AT AN UNQUANTIFIABLE TRACE LEVEL
U	COMPOUND WAS ANALYZED FOR BUT NOT DETECTED
X	SEE CASE NARRATIVE
Y	SEE CASE NARRATIVE
Z	SEE CASE NARRATIVE
*	OUTSIDE OF QUALITY CONTROL LIMITS
*D	COMPOUND ANALYZED FROM A SECONDARY ANALYSIS
*F	RESULT OUTSIDE OF ATI'S QUALITY CONTROL LIMITS
*G	RESULT OUTSIDE QUALITY CONTROL LIMITS. INSUFFICIENT SAMPLE FOR RE-EXTRACTION/ANALYSIS
*H	RESULT OUTSIDE OF LIMITS DUE TO SAMPLE MATRIX INTERFERENCE
*I	BECAUSE OF NECESSARY SAMPLE DILUTION, VALUE WAS OUTSIDE QC LIMITS
*K	DUE TO THE NECESSARY DILUTION OF THE SAMPLE, RESULT WAS NOT ATTAINABLE
*L	ANALYTE IS A SUSPECTED LAB CONTAMINANT
*P	A STANDARD WAS USED TO QUANTITATE THIS VALUE
*R	DATA IS NOT USABLE
*T	SURROGATE RECOVERY IS OUTSIDE QC CONTROL LIMITS. NO CORRECTIVE ACTION INDICATED BY METHOD
*V	SAMPLE RESULT IS >4X SPIKED CONCENTRATION, THEREFORE SPIKE IS NOT DETECTABLE
*Y	RESULT NOT ATTAINABLE DUE TO SAMPLE MATRIX INTERFERENCE
@A	RESULTS OUT OF LIMITS DUE TO SAMPLE NON-HOMOGENEITY
@C	*VARIABLE MESSAGE*
@D	RESULT COULD NOT BE CONFIRMED DUE TO MATRIX INTERFERENCE ON THE CONFIRMATION COLUMN
@E	RESULT MAY BE FALSELY ELEVATED DUE TO SAMPLE MATRIX INTERFERENCE
@F	RESULT OUTSIDE OF CONTRACT SPECIFIED QUALITY CONTROL LIMITS
@G	RESULT OUTSIDE OF CONTRACT SPECIFIED ADVISORY LIMITS
@H	DETECTION LIMIT ELEVATED DUE TO MATRIX INTERFERENCE
@M	RESULT NOT CONFIRMED BY U.V. DUE TO SAMPLE MATRIX INTERFERENCE
@N	RESULT NOT CONFIRMED BY FLUORESCENCE DUE TO SAMPLE MATRIX INTERFERENCE
@P	RESULT QUANTITATED USING FLUORESCENCE ONLY DUE TO THE LOW CONCENTRATION
@Q	DETECTION LIMIT ELEVATED DUE TO LIMITED SAMPLE FOR ANALYSIS
@T	RESULT DUE TO TCLP EXTRACTION MATRIX INTERFERENCE. NO QC LIMITS HAVE BEEN ESTABLISHED
@U	SAMPLE CHROMATOGRAM DOES NOT RESEMBLE COMMON FUEL HYDROCARBON FINGERPRINTS
@Z	SAMPLE CHROMATOGRAM DOES NOT RESEMBLE A FUEL HYDROCARBON

ACCESSION #: 503053

INITIALS: LY

SAMPLE CONDITION UPON RECEIPT CHECKLIST
(FOR RE-ACCESSIONS, COMPLETE #7 THRU #9)

1	Does this project require special handling according to NEESA Levels C, D, AFOEHL or CLP protocols? If yes, complete a) thru c) a) Cooler temperature _____ b) pH sample aliquoted: yes / no / n/a c) LOT #'s: _____	YES	(NO)
2	Are custody seals present on cooler?	YES	(NO)
	If yes, are seals intact? NA	YES	NO
3	Are custody seals present on sample containers?	YES	(NO)
	If yes, are seals intact? NA	YES	NO
4	Is there a Chain-Of-Custody (COC)*?	(YES)	NO
5	Is the COC* complete? Relinquished: (yes)/no Requested analysis: (yes)/no	(YES)	NO
6	Is the COC* in agreement with the samples received? # Samples: (yes)/no Sample ID's: (yes)/no Date sampled: (yes)/no Matrix: (yes)/no # containers: (yes)/no	(YES)	NO
7	Are the samples preserved correctly?	(YES)	NO
8	Is there enough sample for all the requested analyses?	(YES)	NO
9	Are all samples within holding times for the requested analyses?	(YES)	NO
10	Cooler temperature: # 1081 = 2.0°C		
11	Were all sample containers received intact (ie. not broken, leaking, etc.)?	(YES)	NO
12	Are samples requiring no headspace, headspace free? N/A	(YES)	NO
13	Are VOA 1st stickers required?	YES	(NO)
14	Are there special comments on the Chain of Custody which require client contact?	YES	(N/A)
15	If yes, was ATI Project Manager notified?	YES	NO

Describe "no" items: _____

Was client contacted? yes / no

If yes, Date: _____ Name of Person contacted: _____

Describe actions taken or client instructions: _____

*Or other representative documents, letters, and/or shipping memos

Clayton ENVIRONMENTAL CONSULTANTS

REQUEST FOR LABORATORY ANALYTICAL SERVICES

ATI #503053

For Clayton Use Only	Page 1 of 1
Project No.	
Batch No.	
Ind. Code	W.P.
Date Logged In	By

REPORT RESULTS TO

Name: Barry Temple — Title: Geologist/Project Manager
Company: Bowser Environmental — Dept.:
Mailing Address: 401 Waiakamilo Rd Suite 101
City, State, Zip: Honolulu HI 96817
Telephone No.: (808) 832-7920 — Telefax No.: (808) 832-7901

Purchase Order No.: — Client Job No.: 3843

SEND INVOICE TO

Name: Same
Company — Dept.
Address
City, State, Zip

Date Results Req.: — Rush Charges Authorized? ☐ Yes ☒ No — Phone / Fax Results ☐ ☒

Special Instructions: (method, limit of detection, etc.)
Test each sample separately
* Explanation of Preservative:

Samples are: (check if applicable)
☐ Drinking Water
☐ Collected in the State of New York

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added. *)

	CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	8015 Diesel	pH	RCRA Metals	FOR LAB USE ONLY
01-02	TS1-01' and TS1-02'	3/1/95	Soil		1	✓			
03	TS2				1		✓	✓	
04	TS3				1	✓			
05	TS4				1	✓			
06	TS5				1	✓			
07	TS6				1	✓			
08	TS7				1	✓			
09	TS8				1	✓			
10	TS9				1	✓	[illegible]		
11-12	TS10 and TS11 Test each separately				1	✓	✓	✓	

CHAIN OF CUSTODY

Collected by: Barry Temple — Barry Temple (print) — Collector's Signature: Barry Temple
Relinquished by: Barry Temple — Date/Time 3/2/95 11:30 — Received by: — Date/Time
Relinquished by: [illegible] 16/2/95 — Date/Time 3/2 11:52 — Received at Lab by: [illegible] (ATI) — Date/Time 3-3-95/08:45
Method of Shipment: Air — Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain)

Authorized by: Barry Temple — Date 3/2/95
(Client Signature Must Accompany Request)

COOLER #1081 = 2.0°C

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive, Novi, MI 48375, (810) 344-1770
Raritan Center, 160 Fieldcrest Ave., Edison, NJ 08837, (908) 225-6040
400 Chastain Center Blvd., N.W., Suite 490, Kennesaw, GA 30144, (404) 499-7500
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APPENDIX C

1995 Preliminary Remediation Goals - Region IX

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

February 1, 1995

Subject: Region IX Preliminary Remediation Goals (PRGs) First Half 1995

From: Stanford J. Smucker, Ph.D.
Regional Toxicologist (H-9-3)
Technical Support Section

To: PRG Table Mailing List

Please find the update to the Region IX PRG table. The table has been revised to reflect the most current EPA toxicological and risk assessment information. Updates to EPA toxicity values were obtained from IRIS through December 1994 and HEAST through November 1994.

Preliminary Remediation Goals are "evergreen" and will change as new methodologies and parameters are developed. Notable changes in this version of the update include the methods for relating contaminant concentrations in soil to contaminant concentrations in the breathing zone. The dispersion term for the inhalation of volatiles and fugitive dusts emitted from contaminated soils is modeled using an updated dispersion model (AREA-ST, the updated version of the Office of Air Quality Planning and Standards, Industrial Source Complex Model, ISC2). This leads to small changes in the volatilization factors (VF_s) and PEF, and consequently, small changes in the estimate of soil PRGs for volatile contaminants.

The PRG table provides useful risk-based information for Region IX risk assessors and managers. It is noted that California risk-based PRGs ("CAL-Modified PRGs") may differ significantly from the federal values (significance is defined here as differing by a factor of four or more). Where "CAL-Modified PRGs" are significantly more restrictive than the federal numbers, they are also presented in the tables and should be used within the State of California.

In general, PRGs should be used as a predictor of single-contaminant risk estimates for a specific environmental media (e.g. soil, air, and tap water). However, multiple contaminant risks can also be estimated by summing the fractional contribution of each contaminant (see Screening Risk below). This procedure requires gathering additional information, either by downloading the table to display the hidden columns or by using the equations presented in the text for calculating additional concentration terms not provided in the print out.

A contaminant concentration that exceeds a PRG level does not, in itself, mean that there is an unacceptable health threat. However, exceedances should be evaluated further. It is recommended that the reader verify the numbers with a toxicologist because the toxicity/exposure information in the table may contain errors or default assumptions that need to be refined based on further evaluation.

If you are not currently on the PRG mailing list, but would like to be, please make the request through EPA's project manager working on your site. Or, simply download the file (PRG1ST95.ZIP) from California Regional Water Board's BBS [(510) 286-0404]. If you find an error please send me a note via fax at (415) 744-1916.

DISCLAIMER

Preliminary remediation goals (PRGs) focus on common exposure pathways and may not consider all exposure pathways encountered at CERCLA/RCRA sites (Exhibit 1-1). PRGs do not consider impact to groundwater or address ecological concerns. PRGs are specifically not intended as a (1) stand-alone decision-making tool, (2) as a substitute for EPA guidance for preparing baseline risk assessments, or (3) a rule to determine if a waste is hazardous under RCRA.

The guidance set out in this document is not final Agency action. It is not intended, nor can it be relied upon to create any rights enforceable by any party in litigation with the United States. EPA officials may decide to follow the guidance provided herein, or act at variance with the guidance, based on an analysis of specific circumstances. The Agency also reserves the right to change this guidance at any time without public notice.

1.0 INTRODUCTION

The Region IX PRG Table combines EPA toxicity values (updated biannually) with reasonable maximum exposure (RME) factors to estimate concentrations in environmental media (e.g. soil, air, and water) that are protective of humans, including sensitive groups, over a lifetime of exposure. Concentrations above these levels would not automatically designate a site as "dirty" or trigger a response action. However, exceeding a PRG suggests that further evaluation of the potential risks that may be posed by site contaminants is appropriate. PRGs are "evergreen" and will change as new methodologies and parameters are developed.

PRG concentrations presented in the Tables can be used to screen pollutants in environmental media, trigger further investigation, and provide an initial cleanup goal if applicable. When considering PRGs as initial cleanup goals, residential concentrations should be used for maximum beneficial uses of a property. Industrial concentrations for soil only are included in the table as an alternative goal, but industrial concentrations should **not** be used for screening a site. They are meant to provide the manager with an alternative preliminary goal for sites zoned industrial.

Before applying PRGs as screening tools or initial cleanup goals, the user of the table should consider whether the exposure pathways and exposure scenarios at the site are fully accounted for in the PRG calculation. Region IX PRG concentrations are based on exposure pathways for which generally accepted methods, models, and assumptions have been developed (i.e. ingestion, dermal contact, and inhalation) for specific land-use conditions and do not consider impact to groundwater or ecological receptors (see Developing a Conceptual Site Model below).

EXHIBIT 1-1
TYPICAL EXPOSURE PATHWAYS BY MEDIUM
FOR RESIDENTIAL AND INDUSTRIAL LAND USES[a]

EXPOSURE PATHWAYS, ASSUMING:		
MEDIUM	RESIDENTIAL LAND USE	INDUSTRIAL LAND USE
Ground Water	***Ingestion from drinking***	Ingestion from drinking
	Inhalation of volatiles	Inhalation of volatiles
	Dermal absorption from bathing	Dermal absorption
Surface Water	***Ingestion from drinking***	Ingestion from drinking
	Inhalation of volatiles	Inhalation of volatiles
	Dermal absorption from bathing	Dermal absorption
	Ingestion during swimming	
	Ingestion of contaminated fish	
Soil	***Ingestion***	***Ingestion***
	Inhalation of particulates	***Inhalation of particulates***
	Inhalation of volatiles	***Inhalation of volatiles***
	Exposure to indoor air from soil gas	Exposure to indoor air from soil gas
	Exposure to ground water contaminated by soil leachate	Exposure to ground water contaminated by soil leachate
	Ingestion via plant uptake	Inhalation of particulates from trucks and heavy equipment
	Dermal absorption	***Dermal absorption***

Footnote:
[a]Exposure pathways considered in the PRG calculations are indicated in boldface italics.

2.0 READING THE PRG TABLE

2.1 General Considerations:

With the exceptions described below, PRGs are health-based concentrations that correspond to either a one-in-one million (10^{-6}) cancer risk or a chronic hazard quotient of one, whichever is lower. PRG concentrations based on cancer and noncancer concerns are indicated by "ca" and "nc", respectively. Cancer-causing agents may have additional non-cancer PRGs not listed in the Tables. These can be obtained by downloading file (PRG1ST95.ZIP) from California Regional Water Board's Bulletin Board System at [(510)286-0404)] or using the calculations provided below.

In general, PRG concentrations in the table are risk-based but for soil there are two important exceptions: 1) for several volatile chemicals PRGs are based on soil saturation equation ("sat") (see below), and 2) for relatively less toxic inorganic and semivolatile contaminants, a non-risk based "ceiling limit" concentration is given as 10^{+5}mg/kg "max". PRG concentrations that are not risk-based (i.e. either "sat" or "max") should be segregated before screening multiple pollutant risks.

2.2 Toxicity Values:

EPA toxicity values, known as noncarcinogenic reference doses (RfD) and carcinogenic slope factors (SF) were obtained from IRIS through December 1994, HEAST through November 1994, and ECAO-Cincinnati. The priority among sources of toxicological constants used are as follows: (1) IRIS (indicated by "i"), (2) HEAST ("h"), (3) ECAO ("e"), and (4) withdrawn from IRIS or HEAST and under review ("x").

Route-to-route extrapolations ("r") were frequently used when there were no toxicity values available for a given route of exposure. Oral cancer slope factors ("oSF") and reference doses ("oRfD") were used for both oral and inhaled exposures for organic compounds lacking inhalation values. Also, inhalation slope factors ("iSF") and inhalation reference doses ("iRfD") were frequently used for both inhaled and oral exposures for organic compounds lacking oral values. An additional route extrapolation is the use of oral toxicity values for evaluating dermal exposures. **Although route-to-route methods are a useful screening procedure, the appropriateness of these default assumptions for specific contaminants should be verified by a toxicologist.**

2.3 Soil Factors:

Chemical-specific information for soils, volatilization factors ("VF_s") and skin absorption factors ("ABS"), are listed in the table to provide additional assumptions used to calculate soil PRGs. For volatile chemicals, the "VF_s" term was incorporated into the PRG equations to address long-term inhalation exposures. Volatile organic chemicals (VOCs) are indicated by "1" in the VOC column of the Table and are defined as those chemicals having a Henry's Law constant greater than 10^{-5} (atm-m^3/mol) and a molecular weight less than 200 g/mole).

Chemical-specific soil "ABS" values are provided for arsenic, cadmium, pentachlorophenol, PCBs, and dioxin as recommended by EPA's Office of Research and Development (1994) for the evaluation of contaminant absorption through the skin. Otherwise, default skin absorption fractions are assumed to be 0.01 and 0.10, for inorganics and organics, respectively. Although it is debatable whether a default of 0.10 skin absorption is appropriate for volatile contaminants in soils, it should be noted that in practical terms, this assumption makes little difference in the soil PRG because the risk driver for volatiles is generally based on the soil-to-air pathway and not ingestion or skin contact.

3.0 USING THE PRG TABLE

The decision to use PRGs at a site will be driven by the potential benefits of having risk-based concentrations in the absence of site-specific risk assessments. The original intended use of PRGs was to provide initial cleanup goals for individual chemicals given specific medium and land-use combinations (see RAGS Part B, 1991), however risk-based PRGs actually have several uses in addition to providing initial goals. These include:

- Screening sites to determine further evaluation
- Prioritizing areas of concern at megasites (e.g. federal facilities)
- Calculating risks associated with multiple contaminants

A few basic procedures are recommended for using PRGs properly. These are briefly described below. Potential problems with the use of PRGs are also identified.

3.1 Developing a Conceptual Site Model

The primary condition for use of PRGs is that exposure pathways of concern and conditions at the site match those taken into account by the PRG framework. Thus, it is always necessary to develop a conceptual site model (CSM) to identify likely contaminant source areas, exposure pathways, and potential receptors. This information can be used to determine the applicability of PRGs at the site and the need for additional information. For those pathways not covered by PRGs, a risk assessment specific to these additional pathways may be necessary. Nonetheless, the PRG lookup values will still be useful in such situations for focusing further investigative efforts on the exposure pathways not addressed.

To develop a site-specific CSM, perform an extensive records search and compile existing data (e.g. available site sampling data, historical records, aerial photographs, and hydrogeologic information). Once this information is obtained, CSM worksheets such as those provided in ASTM's *Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (1994) can be used to tailor the generic worksheet model to a site-specific CSM. The final CSM diagram represents linkages among contaminant sources, release mechanisms, exposure pathways and routes and receptors. It summarizes our understanding of the contamination problem.

As a final check, the CSM should answer the following questions:

- Are there potential ecological concerns?
- Is there potential for land use other than those covered by the PRGs (that is, residential and industrial)?
- Are there other likely human exposure pathways that were not considered in development of the PRGs (e.g. impact to groundwater, local fish consumption; raising beef, dairy, or other livestock)?
- Are there unusual site conditions (e.g. large areas of contamination, high fugitive dust levels, potential for indoor air contamination)?

If any of these four conditions exist, the PRG may need to be modified to reflect this new information. Suggested references for evaluating pathways not currently evaluated by Region IX PRG's are presented in Exhibit 3-1.

EXHIBIT 3-1
SUGGESTED READINGS FOR EVALUATING SOIL CONTAMINANT PATHWAYS NOT CURRENTLY ADDRESSED BY REGION IX PRGs

EXPOSURE PATHWAY	REFERENCE
Migration of contaminants to an underlying potable aquifer	*Technical Background Document for Soil Screening Guidance - Review Draft* (USEPA 1994c)
Ingestion via plant uptake	*Technical Support Document for Land Application of Sewage Sludge (USEPA 1992a)*
Ingestion via meat or dairy products	*Estimating Exposure to Dioxin-Like Compounds - Review Draft* (1994d)
Inhalation of volatiles that have migrated into basements	*Technical Background Document for Soil Screening Guidance - Review Draft* (USEPA 1994c)
Terrestrial environmental pathways	*Role of the Ecological Risk Assessment in the Baseline Risk Assessment* (USEPA 1994e)

3.2 Background Levels Evaluation

A necessary step in determining the usefulness of Region IX PRGs is the consideration of background contaminant concentrations. EPA may be concerned with two types of background at sites: naturally occurring and anthropogenic. Natural background is usually limited to metals whereas anthropogenic (i.e. human-made) background includes both organic and inorganic contaminants.

Generally EPA does not clean up below natural background. If natural background concentrations are higher than the PRGs, the generic PRGs may not be the best tool for site decisionmaking. Or, an adjustment of the PRG may be needed. For example, naturally occurring arsenic frequently is higher than the soil PRG set equal to a one-in-one-million cancer risk (the point of departure), thus an alternative PRG for arsenic is provided in the lookup tables based on non-cancer endpoints. Because of the problems associated with adjusting PRGs to an alternate risk level, this procedure is not recommended without first consulting a staff toxicologist at state and/or federal regulatory agencies.

Where anthropogenic background levels exceed PRGs and EPA has determined that a response action is necessary and feasible, EPA's goal will be to develop a comprehensive response to the widespread contamination. This will often require coordination with different authorities that have jurisdiction over the sources of contamination in the area.

3.3 Risk Screening

A suggested stepwise approach for screening sites with PRGs is as follows:

- Perform an extensive records search and compile existing data
- Identify site contaminants in the PRG Table. Record the PRG concentrations for various media and note whether PRG is based on cancer risk (indicated by "ca") or

noncancer hazard (indicated by "nc"). Segregate cancer PRGs from non-cancer PRGs and exclude (but don't eliminate) non-risk based PRGs ("sat" or "max").

- For cancer risk estimates, take the site-specific concentration (maximum or 95 UCL) and divide by the PRG concentrations that are designated for cancer evaluation ("ca"). Multiply this ratio by 10^{-6} to estimate chemical-specific risk. For multiple pollutants, simply add the risk for each chemical :

$$Risk = [(\frac{conc_x}{PRG_x}) + (\frac{conc_y}{PRG_y}) + (\frac{conc_z}{PRG_z})] \times 10^{-6}$$

- For non-cancer hazard estimates. Divide concentration term by its respective non-cancer PRG designated as "nc" and sum the ratios for multiple contaminants. [Note that carcinogens may also have an associated non-cancer PRG that is not listed in the printed copy of the table and these will also need to be obtained in order to complete the non-cancer evaluation.] The non-cancer ratio represents a hazard index (HI). A hazard index of 1 or less is generally considered safe . A ratio greater than 1 suggests further evaluation:

$$Hazard\ Index = [(\frac{conc_x}{PRG_x}) + (\frac{conc_y}{PRG_y}) + (\frac{conc_z}{PRG_z})]$$

For more information on screening site risks, the reader should contact EPA Region IX's Technical Support Section.

3. 4 Potential Problems:

As with any risk-based tool, the potential exists for misapplication. In most cases the root cause will be a lack of understanding of the intended use of Region IX PRGs. In order to prevent misuse of PRGs, the following should be avoided:

- Applying PRGs to a site without adequately developing a conceptual site model that identifies relevant exposure pathways and exposure scenarios,
- Not considering background concentrations when choosing PRGs as cleanup goals,
- Use of PRGs as cleanup levels without the nine-criteria analysis specified in the National Contingency Plan (or, comparable analysis for programs outside of Superfund),
- Use of PRGs as cleanup levels without verifying numbers with a toxicologist,
- Use of antiquated PRG Tables that have been superseded by more recent publications, and
- Not considering the effects of additivity when screening multiple chemicals.

4.0 TECHNICAL SUPPORT DOCUMENTATION

PRGs consider human exposure hazards to chemicals from contact with contaminated soils, air, and water. The emphasis of the PRG equations and technical discussion are aimed at developing initial goals for soils, since this is an area where few standards exist. For air and water, additional reference concentrations or standards are available for many chemicals (e.g. non-zero MCLGs, AWQC, and NAAQS) and consequently the discussion of these media are brief.

4.1 Inhalation of Volatiles and Fugitive Dusts:

Agency toxicity criteria indicate that risks from exposure to some chemicals via inhalation far outweigh the risk via ingestion; therefore soil PRGs have been designed to address this pathway as well. The models used to calculate PRGs for inhalation of volatiles/particulates are updates of risk assessment methods presented in RAGS Part B (USEPA 1991a) and are consistent with the *Technical Background Document for Soil Screening Guidance - Review Draft* (USEPA 1994c).

To address the soil-to-air pathways the PRG calculations incorporate volatilization factors (VF_s) for volatile contaminants and particulate emission factors (PEF) for nonvolatile contaminants. These factors relate soil contaminant concentrations to air contaminant concentrations that may be inhaled on-site. The VF_s and PEF equations can be broken into two separate models: an emission model to estimate emissions of the contaminant from the soil and a dispersion model to simulate the dispersion of the contaminant in the atmosphere.

It should be noted that the box model in RAGS Part B has been replaced with a dispersion term (Q/C) derived from a modeling exercise using meteorological data from 29 locations across the United States because the box model may not be applicable to a broad range of site types and meteorology and does not utilize state-of-the-art techniques developed for regulatory dispersion modeling. The dispersion model for both volatiles and particulates is the AREA-ST, an updated version of the Office of Air Quality Planning and Standards, Industrial Source Complex Model, ISC2. However, different Q/C terms are used in the VF and PEF equations. Los Angeles was selected as the 90th percentile data set for volatiles and Minneapolis was selected as the 90th percentile data set for fugitive dusts (USEPA 1994c). A default source size of 0.5 acres was chosen for the PRG calculations. This differs from the default area source (30 acres) assumed in *Technical Background Document for Soil Screening Guidance - Review Draft* (USEPA 1994c). Based on communications with project managers and technical staff, an assumed source size of 30 acres was considered inappropriate for most sites. In addition, these air models are already biased towards predicting long-term exposure concentrations in excess of those likely to occur. If unusual site conditions exist such that the area source is substantially larger than the default source size assumed here, an alternative Q/C could be applied (see USEPA 1994c).

Volatilization Factor for Soils

Volatile chemicals, defined as those chemicals having a Henry's Law constant greater than 10^{-5} (atm-m^3/mol) and a molecular weight less than 200 g/mole, were screened for inhalation exposures using a volatilization factor for soils (VF_s).

The emission terms used in the VF_s are chemical-specific and were calculated from physical-chemical information obtained from a number of sources including *Superfund Exposure Assessment Manual* (reference "1")(SEAM, EPA 1988), *Superfund Public Health Evaluation Manual* (reference "2")(EPA 1986), *Subsurface Contamination Reference Guide* (reference "3")(EPA 1990a) and *Fate and Exposure*

Data (reference "4")(Howard 1991) and are presented in Attachment A. In those cases where Diffusivity Coefficients (Di) were not provided in existing literature, Di's were calculated using Fuller's Method described in SEAM. A surrogate term was required for some chemicals that lacked physico-chemical information. In these cases, a proxy chemical of similar structure was used that may over- or under-estimate the PRG for soils.

Equation 4-9 forms the basis for deriving generic soil PRGs for the inhalation pathway. The following parameters in the standardized equation can be replaced with specific site data to develop a more site-specific PRG

- Source area
- Average soil moisture content
- Average fraction organic carbon content
- Dry soil bulk density

The basic principle of the VF_s model is applicable only if the soil contaminant concentration is at or below soil saturation. Above this level the model cannot predict an accurate VF. If the PRG calculated using VF_s was greater than the calculated "sat", the PRG was set equal to "sat" in accordance with Risk Assessment Guidance for Superfund - Part B (EPA, 1991). Equation 4-10 forms the basis for deriving soil saturation concentrations.

Volatilization Factor for Tap Water

For tap water, an upperbound volatilization constant (VF_s) is used that is based on all uses of household water (e.g showering, laundering, and dish washing). Certain assumptions were made. For example, it is assumed that the volume of water used in a residence for a family of four is 720 L/day, the volume of the dwelling is 150,000 L and the air exchange rate is 0.25 air changes/hour (Andelman in RAGS Part B). Furthermore, it is assumed that the average transfer efficiency weighted by water use is 50 percent [i.e. half of the concentration of each chemical in water will be transferred into air by all water uses. Note: the range of transfer efficiencies extends from 30% for toilets to 90% for dishwashers.

Particulate Emission Factor for Soils

Inhalation of chemicals adsorbed to respirable particles (PM_{10}) were assessed using a default PEF equal to 1.316×10^9 m^3/kg that relates the contaminant concentration in soil with the concentration of respirable particles in the air due to fugitive dust emissions from contaminated soils. The relationship is derived by Cowherd (1985) for a rapid assessment procedure applicable to a typical hazardous waste site where the surface contamination provides a relatively continuous and constant potential for emission over an extended period of time (e.g. years). **This may not be an appropriate assumption for all sites.**

The impact of the PEF on the resultant PRG concentration (that combines soil exposure pathways for ingestion, skin contact, and inhalation) can be assessed by downloading the PRG tables and displaying the hidden columns. With the exception of specific heavy metals, the PEF does not appear to significantly affect most soil PRGs. Equation 4-11 forms the basis for deriving a generic PEF for the inhalation pathway. For more details regarding specific parameters used in the PEF model, the reader is referred to *Technical Background Document for Soil Screening Guidance - Review Draft* (December 1994).

Note: the PEF considers windborne emissions and does not consider dust emissions from traffic or other forms of mechanical disturbance.

4.2 Dermal Absorption of Contaminants in Soil:

Much uncertainty surrounds the determination of hazards associated with skin contact with soils. Thus far, chemical-specific absorption values for skin have been recommended for only five chemicals by EPA's Office of Research and Development. For all other chemicals, default absorption values for inorganics and organics are assumed to be 1 and 10 percent, respectively. An additional uncertainty is the lack of toxicity values for the dermal route. For screening purposes it is assumed that dermal toxicity values can be route-to-route extrapolated from oral values, but this may not always be an appropriate assumption and should be checked.

At 10 % skin absorption, the dermal dose is estimated to equal an ingestion dose for adults, using the best estimate default values in *Dermal Exposure Assessment: Principles and Applications* (EPA 1992). At 1 % absorption, the dermal dose is estimated to be 10% of the oral dose (i.e. based on an adult ingestion rate of 100 mg/day). Note: worker and children intake rates, 50 mg/day and 200 mg/day, respectively, yield somewhat different results.

dermal dose = ingestion dose

$$C_{SOIL} \times ABS \times AF \times SA = C_{SOIL} \times IR$$

$$ABS = \frac{(100 mg/day)}{[(0.2 mg/cm^2\text{-}day)\,(5000 cm^2)]} = 0.10$$

4.3 Exposure Factors:

Default exposure factors were obtained primarily from RAGS Supplemental Guidance Standard Default *Exposure Factors* (OSWER Directive, 9285.6-03) dated March 25, 1991 and supplemented with more recent information from U.S. EPA's Office of Solid Waste and Emergency Response, U.S. EPA's Office of Research and Development, and California EPA's Department of Toxic Substances Control (see Exhibit 4-1).

Because contact rates may be different for children and adults, carcinogenic risks during the first 30 years of life were calculated using age-adjusted factors. Use of age-adjusted factors are especially important for soil ingestion exposures, which are higher during childhood and decrease with age. However, for purposes of combining exposures across pathways, additional age-adjusted factors are used for inhalation and dermal exposures. These factors approximate the integrated exposure from birth until age 30 combining contact rates, body weights, and exposure durations for two age groups - small children and adults. Age-adjusted factors were obtained from RAGS PART B or developed by analogy.

For soils only, noncarcinogenic contaminants are evaluated in children separately from adults. No age-adjustment factor is used in this case. The focus on children is considered protective of the higher daily intake rates of soil by children and their lower body weight. For maintaining consistency, when evaluating soils, dermal and inhalation exposures are also based on childhood contact rates.

(1) ingestion([mg•yr]/[kg•d]:

$$IFS_{adj} = \frac{ED_c \times IRS_c}{BW_c} + \frac{(ED_r - ED_c) \times IRS_a}{BW_a}$$

(2) skin contact([mg•yr]/[kg•d]:

$$SFS_{adj} = \frac{ED_c \times AF \times SA_c}{BW_c} + \frac{(ED_r - ED_c) \times AF \times SA_a}{BW_a}$$

(3) inhalation ([m^3•yr]/[kg•d]):

$$InhF_{adj} = \frac{ED_c \times IRA_c}{BW_c} + \frac{(ED_r - ED_c) \times IRA_a}{BW_a}$$

4.4 PRG Equations:

The equations used to calculate the PRGs for carcinogenic and noncarcinogenic contaminants are presented in Equations 4-1 through 4-8. Calculations of PRGs are consistent with RAGS Part B (U.S. EPA 1991) but also consider updates to the RAGS Part B equations. Briefly, the methodology backcalculates a soil, air, or water concentration level from a target risk (for carcinogens) or hazard quotient (for noncarcinogens). The equations for soil combine across pathways for direct exposures (i.e. ingestion, skin contact, and inhalation). To evaluate route-specific contribution to the PRG concentration, the user can download the PRG table from California Regional Water Board's BBS mentioned above and display the hidden columns.

To calculate PRGs for volatile chemicals in soil, a chemical-specific volatilization factor is calculated per Equation 4-9. Because of its reliance on Henry's law, the VF model is applicable only when the contaminant concentration in soil water is at or below saturation (i.e. there is no free-phase contaminant present). This corresponds to the contaminant concentration in soil at which the adsorptive limits of the soil particles and the solubility limits of the available soil moisture have been reached. Above this point, pure liquid-phase contaminant is expected in the soil. The updated equation for deriving (sat) is presented in Equation 4-10.

EXHIBIT 4-1
STANDARD DEFAULT FACTORS

Symbol	Definition (units)	Default	Reference
CSFo	Cancer slope factor oral (mg/kg-d)-1	–	IRIS, HEAST, or ECAO
CSFi	Cancer slope factor inhaled (mg/kg-d)-1	–	IRIS, HEAST, or ECAO
RfDo	Reference dose oral (mg/kg-d)	–	IRIS, HEAST, or ECAO
RfDi	Reference dose inhaled (mg/kg-d)	–	IRIS, HEAST, or ECAO
TR	Target cancer risk	10^{-6}	–
THQ	Target hazard quotient	1	–
BWa	Body weight, adult (kg)	70[a]	RAGS (Part A), EPA 1989 (EPA/540/1-89/002)
BWc	Body weight, child (kg)	15	Exposure Factors , EPA 1991 (OSWER No. 9285.6-03)
AT	Averaging time - cancer (years)	70	RAGS(Part A), EPA 1989 (EPA/540/1-89/002)
SAa	25% Surface area, adult (cm^2)	5000	Dermal Assessment, EPA 1992 (EPA/600/8-91/011B)
SAc	25% Surface area, child (cm^2)	2000	Dermal Assessment, EPA 1992 (EPA/ 600/8-9/011B)
AF	Adherence factor (mg/cm^2)	0.2	Dermal Assessment, EPA 1992 (EPA/ 600/8-9/011B)
ABS	Skin absorption (unitless):		
	– organics	0.1	PEA, Cal-EPA (DTSC, 1994)
	–Inorganics	0.01	PEA, Cal-EPA (DTSC, 1994)
IRAa	Inhalation rate - adult (m^3/day)	20	Exposure Factors , EPA 1991 (OSWER No. 9285.6-03)
IRAc	Inhalation rate - child (m^3/day)	10	RAGS (Part A), EPA 1989 (EPA/540/1-89/002)
IRWa	Drinking water ingestion - adult (L/day	2	RAGS(Part A), EPA 1989 (EPA/540/1-89/002)
IRWc	Drinking water ingestion - child (L/day)	1	PEA, Cal-EPA (DTSC, 1994)
IRSa	Soil ingestion - adult (mg/day)	100	Exposure Factors , EPA 1991 (OSWER No. 9285.6-03)
IRSc	Soil ingestion - child (mg/day),	200	Exposure Factors , EPA 1991 (OSWER No. 9285.6-03)
IRSo	Soil ingestion - occupational (mg/day)	50	Exposure Factors , EPA 1991 (OSWER No. 9285.6-03)
EFr	Exposure frequency - residential (d/y)	350	Exposure Factors , EPA 1991 (OSWER No. 9285.6-03)
EFo	Exposure frequency - occupational (d/y)	250	Exposure Factors , EPA 1991 (OSWER No. 9285.6-03)
EDr	Exposure duration - residential (years)	30[b]	Exposure Factors , EPA 1991 (OSWER No. 9285.6-03)
EDc	Exposure duration - child (years)	6	Exposure Factors , EPA 1991 (OSWER No. 9285.6-03)
EDo	Exposure duration - occupational (years)	25	Exposure Factors , EPA 1991 (OSWER No. 9285.6-03)
	Age-adjusted factors for carcinogens:		
IFSadj	Ingestion factor, soils ([mg•yr]/[kg•d])	114	RAGS(Part B) , EPA 1991 (OSWER No. 9285.7-01B)
SFSadj	Skin contact factor, soils ([mg•yr]/[kg•d])	503	By analogy to RAGS (Part B)
InhFadj	Inhalation factor ([m^3•yr]/[kg•d])	11	By analogy to RAGS (Part B)
IFWadj	Ingestion factor, water ([l•yr]/[kg•d])	1.1	By analogy to RAGS (Part B)
VFw	Volatilization factor for water (unitless)	0.5	RAGS(Part B) , EPA 1991 (OSWER No. 9285.7-01B)
PEF	Particulate emission factor (m^3/kg)	See below	RAGS(Part B) , EPA 1991 (OSWER No. 9285.7-01B)
VFs	Volatilization factor for soil (m^3/kg)	See below	Technical Background Document for Draft SSL (EPA 1994)
sat	Soil saturation concentration (mg/kg)	See below	Technical Background Document for Draft SSL (EPA 1994)

Footnote:
[a]Seventy years is the averaging time for carcinogens. For noncarcinogens, the averaging time is set equal to the exposure duration (AT = ED).
[b]Exposure duration for lifetime residents is assumed to be 30 years total. For carcinogens, exposures are combined for children (6 years) and adults (24 years) .

PRG EQUATIONS

Soil Equations: For soils, equations were based on three exposure routes (ingestion, skin contact, and inhalation).

Equation 4-1: Combined Exposures to Carcinogenic Contaminants in Residential Soil

$$C(mg/kg) = \frac{TR \times AT \times 365d/y}{EF_r \left[\left(\frac{IFS_{adj} \times CSF_o}{10^6 mg/kg}\right) + \left(\frac{SFS_{adj} \times ABS \times CSF_o}{10^6 mg/kg}\right) + \left(\frac{InhF_{adj} \times CSF_i}{VF_s^a}\right)\right]}$$

Equation 4-2: Combined Exposures to Noncarcinogenic Contaminants in Residential Soil

$$C(mg/kg) = \frac{THQ \times BW_c \times ED_r \times 365d/y}{EF_r \times ED_c \left[\left(\frac{1}{RfD_o} \times \frac{IRS_c}{10^6 mg/kg}\right) + \left(\frac{1}{RfD_o} \times \frac{SA_c \times AF \times ABS}{10^6 mg/kg}\right) + \left(\frac{1}{RfD_i} \times \frac{IRA_c}{VF_s^a}\right)\right]}$$

Equation 4-3: Combined Exposures to Carcinogenic Contaminants in Industrial Soil

$$C(mg/kg) = \frac{TR \times BW_a \times AT\ 365d/y}{EF_o \times ED_o \left[\left(\frac{IRS_o \times CSF_o}{10^6 mg/kg}\right) + \left(\frac{SA_a \times AF \times ABS}{10^6 mg/kg}\right) + \left(\frac{IRA_a \times CSF_i}{VF_s^a}\right)\right]}$$

Equation 4-4: Combined Exposures to Noncarcinogenic Contaminants in Industrial Soil

$$C(mg/kg) = \frac{THQ \times BW_a \times ED_o \times 365d/y}{EF_o \times ED_o \left[\left(\frac{1}{RfD_o} \times \frac{IRS_o}{10^6 mg/kg}\right) + \left(\frac{1}{RfD_o} \times \frac{SA_a \times AF \times ABS}{10^6 mg/kg}\right) + \left(\frac{1}{RfD_i} \times \frac{IRA_a}{VF_s^a}\right)\right]}$$

Footnote:

[a]Use VF_s for volatile chemicals (defined as having a Henry's Law Constant [atm-m^3/mol] greater than 10^{-5} and a molecular weight less than 200 grams/mol) or PEF for non-volatile chemicals.

Tap Water Equations:

Equation 4-5: Ingestion and Inhalation Exposures to Carcinogenic Contaminants in Water

$$C(ug/L) = \frac{TR \times AT \times 365d/y \times 1000ug/mg}{EF_r \left[(IFW_{adj} \times CSF_o) + (VF_w \times InhF_{adj} \times CSF_i)\right]}$$

Equation 4-6: Ingestion and Inhalation Exposures to Noncarcinogenic Contaminants in Water

$$C(ug/L) = \frac{THQ \times BW_a \times EDr \times 365d/y \times 1000ug/mg}{EF_r \times ED_r \left[\left(\frac{IRW_a}{RfD_o}\right) + \left(\frac{VF_w \times IRA_a}{RfD_i}\right)\right]}$$

Air Equations:

Equation 4-7: Inhalation Exposures to Carcinogenic Contaminants in Air

$$C(ug/m^3) = \frac{TR \times AT \times 365d/y \times 1000ug/mg}{EF_r \times InhF_{adj} \times CSF_i}$$

Equation 4-8: Inhalation Exposures to Noncarcinogenic Contaminants in Air

$$C(ug/m^3) = \frac{THQ \times RfD_i \times BW_a \times ED_r \times 365d/y \times 1000ug/mg}{EF_r \times ED_r \times IRA_a}$$

SOIL-TO-AIR VOLATILIZATION FACTOR (VF_s)

Equation 4-9: Derivation of the Volatilization Factor

$$VF_s\,(m^3/kg) = (Q/C) \times \frac{(3.14 \times \alpha \times T)^{1/2}}{(2 \times D_{ei} \times \Theta_a \times K_{as})} \times 10^{-4} m^2/cm^2$$

where:

$$\alpha = \frac{D_{ei} \times \Theta_a}{\Theta_a + [(\rho_s)(1-\Theta_a)/K_{as}]}$$

Parameter	Definition (units)	Default
VF_s	Volatilization factor (m^3/kg)	--
Q/C	Inverse of the mean conc. at the center of a 0.5-acre square source (g/m^2-s per kg/m^3)	68.81
T	Exposure interval (s)	7.9×10^8
Dei	Effective diffusivity (cm^2/s)	$Di(\Theta_a^{3.33}/n^2)$
Θ_a	Air filled soil porosity (L_{air}/L_{soil})	0.28 or $n\text{-}w\rho_b$
Di	Diffusivity in air (cm^2/s)	Chemical-specific
n	Total soil porosity (L_{pore}/L_{soil})	0.43 (loam)
w	Average soil moisture content (g_{water}/g_{soil} or cm^3_{water}/g_{soil})	0.1
ρ_b	Dry soil bulk density (g/cm^3)	1.5 or $(1 - n)\rho_s$
ρ_s	Soil particle density (g/cm^3)	2.65
K_{as}	Soil-air partition coefficient (g-soil/cm^3-air)	(H/Kd) x 41 (41 is a conversion factor)
H	Henry's Law constant (atm-m^3/mol)	Chemical-specific
K_d	Soil-water partition coefficient (cm^3/g)	$K_{oc} \times f_{oc}$
k_{oc}	Soil organic carbon/water partition coefficient (cm^3/g)	Chemical-specific
f_{oc}	Fraction organic carbon content of soil (g/g)	0.02 or site-specific

SOIL SATURATION CONCENTRATION (sat)

Equation 4-10: Derivation of the Soil Saturation Limit

$$sat = \frac{S}{\rho_b} \left(K_d \rho_b + \Theta_w + H' \Theta_a\right)$$

Parameter	Definition (units)	Default
sat	Soil saturation concentration (mg/kg)	--
S	Solubility in water (mg/L-water)	Chemical-specific
ρ_b	Dry soil bulk density (kg/L)	1.5 or $(1 - n)\rho_s$
n	Total soil porosity (L_{pore}/L_{soil})	0.43 (loam)
ρ_s	Soil particle density (kg/L)	2.65
K_d	Soil-water partition coefficient (L/kg)	$K_{oc} \times f_{oc}$ (organics)
k_{oc}	Soil organic carbon/water partition coefficient (L/kg)	Chemical-specific
f_{oc}	Fraction organic carbon content of soil (g/g)	0.02 or site-specific
Θ_w	Water-filled soil porosity (L_{water}/L_{soil})	0.15 or $w\rho_b$
Θ_a	Air filled soil porosity (L_{air}/L_{soil})	0.28 or $n\text{-}w\rho_b$
w	Average soil moisture content (kg_{water}/kg_{soil} or L_{water}/kg_{soil})	0.1
H'	Henry's Law constant (unitless)	H x 41, where 41 is a units conversion factor
H	Henry's Law constant (atm-m^3/mol)	Chemical-specific

SOIL-TO-AIR PARTICULATE EMISSION FACTOR (PEF)

Equation 4-11: Derivation of the Particulate Emission Factor

$$PEF(m^3/kg) = Q/C \times \frac{3600 s/h}{0.036 \times (1-V) \times (U_m/U_t)^3 \times F(x)}$$

Parameter	Definition (units)	Default
PEF	Particulate emission factor (m^3/kg)	1. 316 x 10^9
Q/C	Inverse of the mean concentration at the center of a 0.5-acre-square source (g/m^2-s per kg/m^3)	90.80
V	Fraction of vegetative cover (unitless)	0.5
U_m	Mean annual windspeed (m/s)	4.69
U_t	Equivalent threshold value of windspeed at 7 m (m/s)	11.32
F(x)	Function dependent on U_m/U_t derived using Cowherd (1985) (unitless)	0.194

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ATTACHMENT A

PHYSICAL-CHEMICAL CONSTANTS USED IN CALCULATING SOIL PRGs FOR VOLATILE ORGANIC CHEMICALS

	MW (g/mol)	Henry's Law (atm-m^3/mol)	Diffusivity in Air (cm^2/s)	Koc (ml/g)	Water Solubility (mg/l)	References
Acetone	58	0.000021	0.100	2.2	1000000	1,2
Acrylonitrile	53	0.000088	0.110	0.9	79000	1,2
Ammonia	17	0.000320	0.260	3.1	530000	1,2
Benzene	78	0.005500	0.088	65.0	1800	1,2,3
Benzyl chloride	130	0.000051	0.067	50.0	3300	1,2
Bis(2-chloroethyl)ether	140	0.000290	0.070	14.0	10000	1,2,4
Bis(2-chloroisopropyl)ether	170	0.000110	0.063	61.0	1700	1,2
Bis(chloromethyl)ether	120	0.000200	0.089	1.2	22000	1,2
Bromodichloromethane	160	0.001600	0.080	100.0	4700	2,4
Bromoethene (Surrogate = Bromomethane)	108	0.006200	0.100	130.0	18000	2,4
Bromomethane	95	0.006200	0.100	130.0	18000	2,4
1,3-Butadiene	54	0.180000	0.098	120.0	740	1,2
Carbon disulfide	76	0.012000	0.110	54.0	2900	1,2
Carbon tetrachloride	150	0.024000	0.080	110.0	760	2,3
Chlorine dioxide						
Chloroacetaldehyde						
2-Chloroacetophenone (Surrogate = Chlorobenzene)	150	0.003500	0.072	160.0	470	2,3
Chlorobenzene	110	0.003500	0.072	160.0	470	2,3
2-Chloro-1,3-butadiene	88	0.032000	0.110	50.0	660	2,4
1-Chlorobutane (Surrogate = 2-Chloro-1,3-butadiene)	93	0.032000	0.110	50.0	660	2,4
Chlorodifluoromethane (Surrogate = Dichlorodifluoromethane)	120	0.100000	0.080	58.0	280	1,2,4
1-Chloroethyl vinyl ether						
Chloroform	120	0.003800	0.089	31.0	8200	1,2,4
Chloromethane	51	0.024000	0.110	35.0	8200	1,2,4
2-Chloropropane	79	0.002300	0.080	51.0	2700	1,2
o-Chlorotoluene	127	0.003500	0.072	160.0	470	2,3
Crotonaldehyde (Surrogate = Methyl methacrylate)	70	0.240000	0.091	840.0	20	1,2
Cumene (Surrogate = Ethylbenzene)	120	0.006400	0.075	220.0	150	2,3
1,2-Dibromoethane	190	0.000320	0.073	28.0	3400	2,3
1,2-Dichlorobenzene	150	0.001900	0.130	1100.0	100	2,3
1,3-Dichlorobenzene	150	0.001900	0.130	1200.0	120	2,3
1,4-Dichlorobenzene	150	0.001600	0.130	1200.0	79	2,3
1,4-Dichloro-2-butene (Surrogate = 2-Chloro-1,3-butadiene)	122	0.032000	0.110	50.0	660	1,2
Dichlorodifluoromethane	120	0.100000	0.080	58.0	280	1,2,4
1,1-Dichloroethane	99	0.004300	0.091	30.0	5500	2,3
1,2-Dichloroethane (EDC)	99	0.001200	0.091	14.0	8700	2,3
1,1-Dichloroethylene	97	0.150000	0.079	65.0	400	2,3
1,2-Dichloroethylene (trans)	97	0.006600	0.079	59.0	6300	2,3
1,2-Dichloroethylene (mixture)	97	0.006600	0.079	59.0	6300	2,3
1,2-Dichloropropane	110	0.003600	0.080	51.0	2700	1,2,4
1,3-Dichloropropane	110	0.001300	0.080	48.0	2800	1,2
1,3-Dichloropropene	110	0.001300	0.081	48.0	2800	1,2
Dicyclopentadiene						
Dimethylamine	45	0.000090	0.120	2.2	1000000	1,2
1,4-Dioxane	88	0.000011	0.085	3.5	430000	1,2
Epichlorohydrin	93	0.000032	0.088	3.5	60000	1,2
Ethyl acrylate (Surrogate = Methyl methacrylate)	100	0.240000	0.091	840.0	20	1,2
Ethylbenzene	110	0.007900	0.075	220.0	680	2,3
Ethylene oxide	44	0.000076	0.130	2.2	1000000	1,2
Ethyl chloride	65	0.011000	0.100	15.0	5700	2,3
Ethyl ether	74	0.000013	0.070	14.0	10000	1,2,4
Ethyl methacrylate (Surrogate = Methyl methacrylate)	120	0.240000	0.091	840.0	20	1,2
Hydrogen sulfide						
Methacrylonitrile (Surrogate = Acrylonitrile)	93	0.000088	0.110	0.9	79000	1,2
Methyl acetate (Surrogate = Acetone)	74	0.000021	0.100	2.2	1000000	1,2
Methyl acrylate (Surrogate = Methyl methacrylate)	100	0.240000	0.091	840.0	20	1,2
Methylene chloride	85	0.002600	0.100	8.8	13200	2,3
Methyl ethyl ketone	72	0.000027	0.090	4.5	270000	2,3
Methyl styrene (mixture) (Surrogate = Styrene)	119	0.002300	0.071	360.0	300	2,3
Methyl styrene (alpha) (Surrogate = Styrene)	119	0.002300	0.071	360.0	300	2,3
Nitrogen dioxide						
2-Nitropropane						
Polynuclear aromatic hydrocarbons						
Acenaphthene	150	0.001200	0.064	4600.0	4	2,3
Anthracene	180	0.000034	0.058	13000.0	0	2,3
Fluorene	170	0.000064	0.061	7900.0	2	2,3
Naphthalene	130	0.001300	0.069	1300.0	31	2,3
Phenanthrene	180	0.000040	0.058	14000.0	1	2,3
Propylene oxide	58					
Styrene	100	0.002300	0.071	360.0	300	2,3
1,1,1,2-Tetrachloroethane	170	0.000380	0.073	54.0	2900	1,2
1,1,2,2-Tetrachloroethane	170	0.000500	0.073	220.0	2900	2,3
Tetrachloroethylene (PCE)	170	0.023000	0.072	660.0	150	2,3
Tetrahydrofuran	72	0.000110	0.089			2,3
Toluene	92	0.006600	0.078	260.0	520	2,3
1,2,4-Trichlorobenzene	180	0.002300	0.062	9200.0	30	1,2
1,1,1-Trichloroethane	130	0.002800	0.080	150.0	950	2,3
1,1,2-Trichloroethane	130	0.001200	0.080	56.0	4500	2,3
Trichloroethylene (TCE)	130	0.008920	0.081	130.0	1000	2,3
Trichlorofluoromethane	137	0.097000	0.087	160.0	1100	1,2,4
1,1,2-Trichloropropane (Surrogate = 1,2-Dichloropropane)	147	0.003600	0.080	51.0	2700	1,2
1,2,3-Trichloropropane (Surrogate = 1,2-Dichloropropane)	147	0.003600	0.080	51.0	2700	1,2
1,2,3-Trichloropropene (Surrogate = 1,3-Dichloropropene)	146	0.001300	0.081	48.0	2800	1,2
1,1,2-Trichloro-1,2,2-trifluoroethane (S = Trichlorofluoromethane)	186	0.058000	0.087	160.0	1100	1,2,4
Triethylamine (Surrogate = Dimethylamine)	86	0.000090	0.120	2.2	1000000	1,2
Vinyl chloride	63	0.700000	0.110	57.0	1100	2,3
m-Xylene	110	0.006900	0.087	240.0	200	2,3
o-Xylene	110	0.004900	0.087	240.0	200	2,3
p-Xylene	110	0.007000	0.087	240.0	200	2,3
Xylene (mixed)	110	0.005300	0.087	240.0	200	2,3

Key : i=IRIS h=HEAST e=ECAO x=WITHDRAWN r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sal=SOIL SATURATION max=CEILING LIMIT *(nc < 100X ca) **(nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY VALUES							SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF 1/(mg/kg-d)		oRfD (mg/kg-d)		iSF 1/(mg/kg-d)		iRfD (mg/kg-d)		V O C	skin ABS	VF (m^3/kg)	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
8.7E-03	i	4.0E-03	i	8.7E-03	r	4.0E-03	r	0	0.10		30560-19-1	Acephate	5.1E+01	ca**	2.2E+02	ca*	7.7E-01	ca*	7.7E+00	ca*
						2.6E-03	i	0	0.10		75-07-0	Acetaldehyde					9.4E+00	nc		
		2.0E-02	i			2.0E-02	r	0	0.10		34256-82-1	Acetochlor	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		1.0E-01	i			1.0E-01	r	1	0.10	1.9E+04	67-64-1	Acetone	2.0E+03	nc	8.4E+03	nc	3.7E+02	nc	6.1E+02	nc
		8.0E-04	h			2.9E-03	x	0	0.10		75-86-5	Acetone cyanohydrin	4.6E+03	nc	4.8E+04	nc	1.0E+01	nc	2.6E+03	nc
		6.0E-03	i			1.4E-02	h	0	0.10		75-05-8	Acetonitrile	3.9E+02	nc	4.1E+03	nc	5.2E+01	nc	2.2E+02	nc
		1.0E-01	i			5.7E-06	x	0	0.10		98-86-2	Acetophenone	5.6E+03	nc	4.5E+04	nc	2.1E-02	nc	3.7E+03	nc
		1.3E-02	i			1.3E-02	r	0	0.10		50594-66-6	Acifluorfen	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc
		2.0E-02	h			5.7E-06	i	0	0.10		107-02-8	Acrolein	1.3E+03	nc	1.2E+04	nc	2.1E-02	nc	7.3E+02	nc
4.6E+00	i	2.0E-04	i	4.6E+00	i	2.0E-04	r	0	0.10		79-06-1	Acrylamide	9.8E-02	ca*	4.2E-01	ca	1.5E-03	ca	1.5E-02	ca
		5.0E-01	i			8.6E-04	i	0	0.10		79-10-7	Acrylic acid	3.2E+04	nc	3.4E+05	nc	3.1E+00	nc	1.8E+04	nc
5.4E-01	i	1.0E-03	h	2.4E-01	i	5.7E-04	i	1	0.10	5.4E+03	107-13-1	Acrylonitrile	1.3E-01	ca*	3.0E-01	ca*	2.8E-02	ca*	3.7E+00	ca*
8.1E-02	h	1.0E-02	i	8.0E-02	r	1.0E-02	r	0	0.10		15972-60-8	Alachlor	5.5E+00	ca*	2.4E+01	ca	8.4E-02	ca	8.4E-01	ca
		1.5E-01	i			1.5E-01	r	0	0.10		1596-84-5	Alar	9.8E+03	nc	1.0E+05	nc	5.5E+02	nc	5.5E+03	nc
		1.0E-03	i			1.0E-03	r	0	0.10		116-06-3	Aldicarb	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc
		1.0E-03	i			1.0E-03	r	0	0.10		1646-88-4	Aldicarb sulfone	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc
1.7E+01	i	3.0E-05	i	1.7E+01	i	3.0E-05	r	0	0.10		309-00-2	Aldrin	2.6E-02	ca*	1.1E-01	ca	3.9E-04	ca	4.0E-03	ca
		2.5E-01	i			2.5E-01	r	0	0.10		5585-64-8	Ally	1.6E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc
		5.0E-03	x			5.0E-03	r	0	0.10		107-18-6	Allyl alcohol	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		5.0E-02	h			2.9E-04	i	0	0.10		107-05-1	Allyl chloride	3.3E+03	nc	3.4E+04	nc	1.0E+00	nc	1.8E+03	nc
		1.0E+00	e					0	0.01		7429-90-5	Aluminum	7.7E+04	nc	1.0E+05	max			3.7E+04	nc
		4.0E-04	i					0	0.01		20859-73-8	Aluminum phosphide	3.1E+01	nc	6.8E+02	nc			1.5E+01	nc
		3.0E-04	i			3.0E-04	r	0	0.10		67485-29-4	Amdro	2.0E+01	nc	2.0E+02	nc	1.1E+00	nc	1.1E+01	nc
		9.0E-03	i			9.0E-03	r	0	0.10		834-12-8	Ametryn	5.9E+02	nc	6.1E+03	nc	3.3E+01	nc	3.3E+02	nc
		7.0E-02	h			7.0E-02	r	0	0.10		591-27-5	m-Aminophenol	4.6E+03	nc	4.8E+04	nc	2.6E+02	nc	2.6E+03	nc
		2.0E-05	h			2.0E-05	r	0	0.10		504-24-5	4-Aminopyridine	1.3E+00	nc	1.4E+01	nc	7.3E-02	nc	7.3E-01	nc
		2.5E-03	i			2.5E-03	r	0	0.10		33089-61-1	Amitraz	1.6E+02	nc	1.7E+03	nc	9.1E+00	nc	9.1E+01	nc
						2.9E-02	i	0	0.10	3.6E+03	7664-41-7	Ammonia					1.0E+02	nc		
		2.0E-01	i					0	0.10		7773-06-0	Ammonium sulfamate	1.3E+04	nc	1.0E+05	max			7.3E+03	nc
5.7E-03	i	2.9E-04	r	5.7E-03	r	2.9E-04	i	0	0.10		62-53-3	Aniline	1.9E+01	nc	2.0E+02	nc	1.0E+00	nc	1.1E+01	nc
		4.0E-04	i					0	0.01		7440-36-0	Antimony and compounds	3.1E+01	nc	6.8E+02	nc			1.5E+01	nc
		5.0E-04	h					0	0.01		1314-60-9	Antimony pentoxide	3.8E+01	nc	8.5E+02	nc			1.8E+01	nc
		9.0E-04	h					0	0.01		28300-74-5	Antimony potassium tartrate	6.9E+01	nc	1.5E+03	nc			3.3E+01	nc
		4.0E-04	h					0	0.01		1332-81-6	Antimony tetroxide	3.1E+01	nc	6.8E+02	nc			1.5E+01	nc
		4.0E-04	h					0	0.01		1309-64-4	Antimony trioxide	3.1E+01	nc	6.8E+02	nc			1.5E+01	nc
		1.3E-02	i			1.3E-02	r	0	0.10		74115-24-5	Apollo	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc
2.5E-02	i	5.0E-02	h	2.5E-02	i	5.0E-02	r	0	0.10		140-57-8	Aramite	1.8E+01	ca*	7.6E+01	ca	2.7E-01	ca	2.7E+00	ca
		3.0E-04	i					0	0.03		7440-38-2	Arsenic (noncancer endpoint)	2.2E+01	nc						
1.8E+00	i	3.0E-04	i	1.5E+01	i			0	0.03		7440-38-2	Arsenic (cancer endpoint)	3.2E-01	ca*	2.0E+00	ca	4.5E-04	ca	3.8E-02	ca

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FOR PLANNING PURPOSES

TOXICITY VALUES						SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF 1/(mg/kg-d)		oRfD (mg/kg-d)		ISF 1/(mg/kg-d)		IRfD (mg/kg-d)		VOC	skin ABS	VF (m^3/kg)	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
						1.4E-05	i	0	NA		7784-42-1	Arsine					5.2E-02	nc		
		9.0E-03	i			9.0E-03	r	0	0.10		76578-12-6	Assure	5.9E+02	nc	6.1E+03	nc	3.3E+01	nc	3.3E+02	nc
		5.0E-02	i			5.0E-02	r	0	0.10		3337-71-1	Asulam	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
2.2E-01	h	3.5E-02	h	2.2E-01	r	3.5E-02	h	0	0.10		1912-24-9	Atrazine	2.0E+00	ca	8.6E+00	ca	3.1E-02	ca	3.0E-01	ca
		4.0E-04	i			4.0E-04	r	0	0.10		71751-41-2	Avermectin B1	2.6E+01	nc	2.7E+02	nc	1.5E+00	nc	1.5E+01	nc
1.1E-01	i			1.1E-01	i			0	0.10		103-33-3	Azobenzene	4.0E+00	ca	1.7E+01	ca	6.2E-02	ca	6.1E-01	ca
		7.0E-02	i			1.4E-04	h	0	0.01		7440-39-3	Barium and compounds	5.3E+03	nc	1.0E+05	max	5.2E-01	nc	2.6E+03	nc
		4.0E-03	i			4.0E-03	r	0	0.10		114-26-1	Baygon	2.6E+02	nc	2.7E+03	nc	1.5E+01	nc	1.5E+02	nc
		3.0E-02	i			3.0E-02	r	0	0.10		43121-43-3	Bayleton	2.0E+03	nc	2.0E+04	nc	1.1E+02	nc	1.1E+03	nc
		2.5E-02	i			2.5E-02	r	0	0.10		68359-37-5	Baythroid	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc
		3.0E-01	i			3.0E-01	r	0	0.10		1861-40-1	Benefin	2.0E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc
		5.0E-02	i			5.0E-02	r	0	0.10		17804-35-2	Benomyl	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
		2.5E-03	i			2.5E-03	r	0	0.10		25057-89-0	Bentazon	1.6E+02	nc	1.7E+03	nc	9.1E+00	nc	9.1E+01	nc
		1.0E-01	i			1.0E-01	r	0	0.10		100-52-7	Benzaldehyde	6.5E+03	nc	6.8E+04	nc	3.7E+02	nc	3.7E+03	nc
2.9E-02	i			2.9E-02	i			1	0.10	6.7E+03	71-43-2	Benzene	1.4E+00	ca	3.2E+00	ca	2.3E-01	ca	3.9E-01	ca
2.3E+02	i	3.0E-03	i	2.3E+02	i	3.0E-03	r	0	0.10		92-87-5	Benzidine	1.9E-03	ca	8.3E-03	ca	2.9E-05	ca	2.9E-04	ca
		4.0E+00	i			4.0E+00	i	0	0.10		65-85-0	Benzoic acid	1.0E+05	max	1.0E+05	max	1.5E+04	nc	1.5E+05	nc
1.3E+01	i			1.3E+01	r			0	0.10		98-07-7	Benzotrichloride	3.4E-02	ca	1.5E-01	ca	5.2E-04	ca	5.2E-03	ca
		3.0E-01	h			3.0E-01	r	0	0.10		100-51-6	Benzyl alcohol	2.0E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc
1.7E-01	i			1.7E-01	r			1	0.10	7.1E+04	100-44-7	Benzyl chloride	1.4E+00	ca	3.9E+00	ca	4.0E-02	ca	6.6E-02	ca
4.3E+00	i	5.0E-03	i	8.4E+00	i			0	0.01		7440-41-7	Beryllium and compounds	1.4E-01	ca	1.1E+00	ca	8.0E-04	ca	1.6E-02	ca
		1.0E-04	i			1.0E-04	r	0	0.10		141-66-2	Bidrin	6.5E+00	nc	6.8E+01	nc	3.7E-01	nc	3.7E+00	nc
		1.5E-02	i			1.5E-02	r	0	0.10		82657-04-3	Biphenthrin (Talstar)	9.8E+02	nc	1.0E+04	nc	5.5E+01	nc	5.5E+02	nc
		5.0E-02	i			5.0E-02	r	0	0.10		92-52-4	1,1-Biphenyl	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
1.1E+00	i			1.2E+00	i			1	0.10	1.5E+04	111-44-4	Bis(2-chloroethyl)ether	7.4E-02	ca	1.7E-01	ca	5.8E-03	ca	9.8E-03	ca
7.0E-02	h	4.0E-02	i	3.5E-02	h	4.0E-02	r	1	0.10	5.4E+04	39638-32-9	Bis(2-chloroisopropyl)ether	3.9E+00	ca	1.2E+01	ca	1.9E-01	ca	2.7E-01	ca
2.2E+02	i			2.2E+02	i			1	0.10	4.7E+03	542-88-1	Bis(chloromethyl)ether	1.4E-04	ca	3.0E-04	ca	3.1E-05	ca	5.2E-05	ca
7.0E-02	x			7.0E-02	x			0	0.10		108-60-1	Bis(2-chloro-1-methylethyl)ether	6.3E+00	ca	2.7E+01	ca	9.6E-02	ca	9.6E-01	ca
1.4E-02	i	2.0E-02	i	1.4E-02	r	2.2E-02	r	0	0.10		117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	3.2E+01	ca*	1.4E+02	ca	4.8E-01	ca	4.8E+00	ca
		5.0E-02	i			5.0E-02	r	0	0.10		80-05-7	Bisphenol A	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
		9.0E-02	i			5.7E-03	h	0	0.10		7440-42-8	Boron	5.9E+03	nc	6.1E+04	nc	2.1E+01	nc	3.3E+03	nc
						2.0E-04	h	0	0.10		7637-07-2	Boron trifluoride					7.3E-01	nc		
6.2E-02	i	2.0E-02	i	6.2E-02	r	2.0E-02	r	1	0.10	1.6E+04	75-27-4	Bromodichloromethane	1.4E+00	ca	3.4E+00	ca	1.1E-01	ca	1.8E-01	ca
1.1E-01	r	8.6E-04	r	1.1E-01	h	8.6E-04	i	1	0.10	8.3E+03	593-60-2	Bromoethene (vinyl bromide)	4.5E-01	ca*	1.0E+00	ca*	6.1E-02	ca*	1.0E-01	ca*
7.9E-03	i	2.0E-02	i	3.9E-03	i	2.0E-02	r	0	0.10		75-25-2	Bromoform (tribromomethane)	5.6E+01	ca**	2.4E+02	ca*	1.7E+00	ca*	8.5E+00	ca*
		1.4E-03	i			1.4E-03	i	1	0.10	8.3E+03	74-83-9	Bromomethane	1.5E+01	nc	5.7E+01	nc	5.2E+00	nc	8.7E+00	nc
								0	0.10		101-55-3	4-Bromophenyl phenyl ether								
		5.0E-03	h			5.0E-03	r	0	0.10		2104-96-3	Bromophos	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		2.0E-02	i			2.0E-02	r	0	0.10		1689-84-5	Bromoxynil	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	1.8E+02	nc

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FOR PLANNING PURPOSES

TOXICITY VALUES						SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF 1/(mg/kg-d)		oRfD (mg/kg-d)		iSF 1/(mg/kg-d)		iRfD (mg/kg-d)		VOC	skin ABS	VF (m^3/kg)	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
		2.0E-02	I			2.0E-02	r	0	0.10		1689-99-2	Bromoxynil octanoate	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
9.8E-01	r			9.8E-01	I			1	0.10	1.3E+03	106-99-0	1,3-Butadiene	8.6E-03	ca	1.8E-02	ca	6.9E-03	ca	1.1E-02	ca
		1.0E-01	I			1.0E-01	r	0	0.10		71-36-3	1-Butanol	6.5E+03	nc	6.8E+04	nc	3.7E+02	nc	3.7E+03	nc
		5.0E-02	I			5.0E-02	r	0	0.10		2008-41-5	Butylate	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
		2.0E-01	I			2.0E-01	r	0	0.10		85-68-7	Butyl benzyl phthalate	1.3E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc
		1.0E+00	I			1.0E+00	r	0	0.10		85-70-1	Butylphthalyl butylglycolate	6.5E+04	nc	1.0E+05	max	3.7E+03	nc	3.7E+04	nc
		3.0E-03	h			3.0E-03	r	0	0.10		75-60-5	Cacodylic acid	2.0E+02	nc	2.0E+03	nc	1.1E+01	nc	1.1E+02	nc
		5.0E-04	I	6.3E+00	I			0	0.01		7440-43-9	Cadmium and compounds	3.8E+01	nc	8.5E+02	nc	1.1E-03	ca	1.8E+01	nc
												"CAL-Modified PRG" (PEA, 1994)	9.0E+00							
		5.0E-01	I			5.0E-01	r	0	0.10		105-60-2	Caprolactam	3.3E+04	nc	1.0E+05	max	1.8E+03	nc	1.8E+04	nc
8.6E-03	h	2.0E-03	I	8.6E-03	r	2.0E-03	r	0	0.10		2425-06-1	Captafol	5.2E+01	nc	2.2E+02	ca*	7.8E-01	ca*	7.8E+00	ca*
3.5E-03	h	1.3E-01	I	3.5E-03	r	1.3E-01	r	0	0.10		133-06-2	Captan	1.3E+02	ca*	5.5E+02	ca	1.9E+00	ca	1.9E+01	ca
		1.0E-01	I			1.1E-01	r	0	0.10		63-25-2	Carbaryl	6.5E+03	nc	6.8E+04	nc	4.0E+02	nc	3.7E+03	nc
2.0E-02	h			2.0E-02	r			0	0.10		86-74-8	Carbazole	2.2E+01	ca	9.5E+01	ca	3.4E-01	ca	3.4E+00	ca
		5.0E-03	I			5.0E-03	r	0	0.10		1563-66-2	Carbofuran	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		1.0E-01	I			2.9E-03	h	1	0.10	3.6E+03	75-15-0	Carbon disulfide	1.6E+01	nc	5.2E+01	nc	1.0E+01	nc	2.1E+01	nc
1.3E-01	I	7.0E-04	I	5.3E-02	I	5.7E-04	e	1	0.10	4.3E+03	56-23-5	Carbon tetrachloride	4.7E-01	ca*	1.1E+00	ca*	1.3E-01	ca*	1.7E-01	ca*
		1.0E-02	I			1.0E-02	r	0	0.10		55285-14-8	Carbosulfan	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
		1.0E-01	I			1.0E-01	r	0	0.10		5234-68-4	Carboxin	6.5E+03	nc	6.8E+04	nc	3.7E+02	nc	3.7E+03	nc
		2.0E-03	I			2.0E-03	r	0	0.10		302-17-0	Chloral	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
		1.5E-02	I			1.5E-02	r	0	0.10		133-90-4	Chloramben	9.8E+02	nc	1.0E+04	nc	5.5E+01	nc	5.5E+02	nc
4.0E-01	h			4.0E-01	r			0	0.10		118-75-2	Chloranil	1.1E+00	ca	4.7E+00	ca	1.7E-02	ca	1.7E-01	ca
1.3E+00	I	6.0E-05	I	1.3E+00	I	6.0E-05	r	0	0.10		57-74-9	Chlordane	3.4E-01	ca**	1.5E+00	ca*	5.2E-03	ca*	5.2E-02	ca*
		2.0E-02	I			2.0E-02	r	0	0.10		90982-32-4	Chlorimuron-ethyl	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		1.0E-01	I					0	0.01		7782-50-5	Chlorine	7.7E+03	nc	1.7E+05	nc			3.7E+03	nc
						5.7E-05	I	1	0.10		10049-04-4	Chlorine dioxide					2.1E-01	nc		
								1	0.10		107-20-0	Chloroacetaldehyde								
		2.0E-03	h			2.0E-03	r	0	0.10		79-11-8	Chloroacetic acid	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
		8.6E-06	r			8.6E-06	I	1	0.10	6.4E+03	532-27-4	2-Chloroacetophenone	7.5E-02	nc	2.7E-01	nc	3.1E-02	nc	5.2E-02	nc
		4.0E-03	I			4.0E-03	r	0	0.10		106-47-8	4-Chloroaniline	2.6E+02	nc	2.7E+03	nc	1.5E+01	nc	1.5E+02	nc
		2.0E-02	I			5.7E-03	h	1	0.10	2.1E+04	108-90-7	Chlorobenzene	1.6E+02	nc	5.7E+02	nc	2.1E+01	nc	3.9E+01	nc
2.7E-01	h	2.0E-02	I	2.7E-01	h	2.0E-02	r	0	0.10		510-15-6	Chlorobenzilate	1.6E+00	ca	7.1E+00	ca	2.5E-02	ca	2.5E-01	ca
		2.0E-01	h			2.0E-01	r	0	0.10		74-11-3	p-Chlorobenzoic acid	1.3E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc
		2.0E-02	h			2.0E-02	r	0	0.10		98-56-6	4-Chlorobenzotrifluoride	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		2.0E-02	h			2.0E-03	h	1	0.10	2.0E+03	126-99-8	2-Chloro-1,3-butadiene	6.3E+00	nc	2.1E+01	nc	7.3E+00	nc	1.4E+01	nc
		4.0E-01	h			4.0E-01	r	1	0.10	2.0E+03	109-69-3	1-Chlorobutane	8.1E+02	sat	8.1E+02	sat	1.5E+03	nc	2.4E+03	nc
								1	0.10		110-75-8	2-Chloroethyl vinyl ether								
		1.4E+01	r			1.4E+01	I	1	0.10	1.3E+03	75-45-6	Chlorodifluoromethane	3.5E+02	sat	3.5E+02	sat	5.1E+04	nc	8.5E+04	nc
6.1E-03	I	1.0E-02	I	8.1E-02	I	1.0E-02	r	1	0.10	6.4E+03	67-66-3	Chloroform	5.3E-01	ca	1.1E+00	ca	8.4E-02	ca	1.6E-01	ca

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FOR PLANNING PURPOSES

TOXICITY VALUES						SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF 1/(mg/kg-d)		oRfD (mg/kg-d)		ISF 1/(mg/kg-d)		IRfD (mg/kg-d)		VOC	skin ABS	VF (m^3/kg)	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
1.3E-02	h			6.3E-03	h			1	0.10	2.0E+03	74-87-3	Chloromethane	2.0E+00	ca	4.3E+00	ca	1.1E+00	ca	1.5E+00	ca
5.8E-01	h			5.8E-01	r			0	0.10		95-69-2	4-Chloro-2-methylaniline	7.7E-01	ca	3.3E+00	ca	1.2E-02	ca	1.2E-01	ca
4.6E-01	h			4.6E-01	r			0	0.10		3165-93-3	4-Chloro-2-methylaniline hydrochloride	9.7E-01	ca	4.1E+00	ca	1.5E-02	ca	1.5E-01	ca
		8.0E-02	I			8.0E-02	r	0	0.10		91-58-7	beta-Chloronaphthalene	5.2E+03	nc	5.5E+04	nc	2.9E+02	nc	2.9E+03	nc
2.5E-02	h			2.5E-02	r		r	0	0.10		88-73-3	o-Chloronitrobenzene	1.8E+01	ca	7.6E+01	ca	2.7E-01	ca	2.7E+00	ca
1.8E-02	h			1.8E-02	r		r	0	0.10		100-00-5	p-Chloronitrobenzene	2.5E+01	ca	1.1E+02	ca	3.7E-01	ca	3.7E+00	ca
		5.0E-03	I			5.0E-03	r	0	0.10		95-57-8	2-Chlorophenol	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		2.9E-02	r			2.9E-02	h	1	0.10	9.7E+03	75-29-6	2-Chloropropane	3.5E+02	nc	1.3E+03	nc	1.0E+02	nc	1.7E+02	nc
1.1E-02	h	1.5E-02	I	1.1E-02	r	1.5E-02	r	0	0.10		1897-45-6	Chlorothalonil	4.0E+01	ca**	1.7E+02	ca*	6.1E-01	ca*	6.1E+00	ca*
		2.0E-02	I			2.0E-02	r	1	0.10	1.5E+04	95-49-8	o-Chlorotoluene	3.4E+02	nc	1.6E+03	sat	7.3E+01	nc	1.2E+02	nc
		2.0E-01	I			2.0E-01	r	0	0.10		101-21-3	Chlorpropham	1.3E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc
		3.0E-03	I			3.0E-03	r	0	0.10		2921-88-2	Chlorpyrifos	2.0E+02	nc	2.0E+03	nc	1.1E+01	nc	1.1E+02	nc
		1.0E-02	h			1.0E-02	r	0	0.10		5598-13-0	Chlorpyrifos-methyl	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
		5.0E-02	I			5.0E-02	r	0	0.10		64902-72-3	Chlorsulfuron	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
		8.0E-04	h			8.0E-04	r	0	0.10		21923-23-9	Chlorthiophos	5.2E+01	nc	5.5E+02	nc	2.9E+00	nc	2.9E+01	nc
				4.2E+01	I			0	0.01		n/a	Total Chromium (1/6 ratio Cr VI/Cr III)	2.1E+02	ca	1.6E+03	ca	1.6E-04	ca		
		5.0E-03	I	2.9E+02	I			0	0.01		7440-47-3	Chromium VI	3.0E+01	ca	2.3E+02	ca	2.3E-05	ca	1.8E+02	nc
												"CAL-Modified PRG" (PEA, 1994)	2.0E-01						1.6E-01	
						2.9E-04	e	0	0.01		7440-48-4	Cobalt					1.0E+00	nc		
				2.2E+00	I			0	0.01		8007-45-2	Coke Oven Emissions					3.1E-03	ca		
		3.7E-02	h					0	0.01		7440-50-8	Copper and compounds	2.8E+03	nc	6.3E+04	nc			1.4E+03	nc
1.9E+00	h	1.0E-02	x	1.9E+00	x	1.0E-02	r	1	0.10	3.5E+03	123-73-9	Crotonaldehyde	1.2E-02	ca	2.6E-02	ca	3.5E-03	ca	5.9E-03	ca
		4.0E-02	I			2.6E-03	h	1	0.10	1.2E+04	98-82-8	Cumene	4.9E+01	nc	1.6E+02	nc	9.4E+00	nc	1.9E+01	nc
8.4E-01	h	2.0E-03	h	8.4E-01	r	2.0E-03	r	0	0.10		21725-46-2	Cyanazine	1.3E+02	ca*	2.3E+00	ca	8.0E-03	ca	8.0E-02	ca
									0.01		n/a	Cyanides								
		1.0E-01	h					0	0.01		542-62-1	Barium cyanide	7.7E+03	nc	1.0E+05	max			3.7E+03	nc
		5.0E-03	I					0	0.01		544-92-3	Copper cyanide	3.8E+02	nc	8.5E+03	nc			1.8E+02	nc
		4.0E-02	I					0	0.01		592-01-8	Calcium cyanide	3.1E+03	nc	6.8E+04	nc			1.5E+03	nc
		4.0E-02	I					0	0.10		460-19-5	Cyanogen	2.6E+03	nc	2.7E+04	nc			1.5E+03	nc
		9.0E-02	I					0	0.10		506-68-3	Cyanogen bromide	5.9E+03	nc	1.0E+05	max			3.3E+03	nc
		5.0E-02	I					0	0.10		506-77-4	Cyanogen chloride	3.3E+03	nc	3.4E+04	nc			1.8E+03	nc
		2.0E-02	I					0	0.10		57-12-5	Free cyanide	1.3E+03	nc	1.4E+04	nc			7.3E+02	nc
		2.0E-02	I			8.6E-04	I	1	0.10		74-90-8	Hydrogen cyanide					3.1E+00	nc	6.2E+00	nc
		5.0E-02	I					0	0.10		151-50-8	Potassium cyanide	3.3E+03	nc	3.4E+04	nc			1.8E+03	nc
		2.0E-01	I					0	0.10		506-61-6	Potassium silver cyanide	1.3E+04	nc	1.0E+05	max			7.3E+03	nc
		1.0E-01	I					0	0.10		506-64-9	Silver cyanide	6.5E+03	nc	1.0E+05	max			3.7E+03	nc
		4.0E-02	I					0	0.10		143-33-9	Sodium cyanide	2.6E+03	nc	2.7E+04	nc			1.5E+03	nc
		5.0E-02	I					0	0.10		557-21-1	Zinc cyanide	3.3E+03	nc	3.4E+04	nc			1.8E+03	nc
		5.0E+00	I			5.0E+00	r	0	0.10		108-94-1	Cyclohexanone	1.0E+05	max	1.0E+05	max	1.8E+04	nc	1.8E+05	nc

Key: i=IRIS h=HEAST o=HEAST x=WITHDRAWN r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(nc < 100X ca) **(nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY VALUES							SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF 1/(mg/kg-d)		oRfD (mg/kg-d)		ISF 1/(mg/kg-d)		iRfD (mg/kg-d)	VOC	skin ABS	VF (m^3/kg)	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
		2.0E-01	i			2.0E-01	r 0	0.10		108-91-8	Cyclohexylamine	1.3E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc
		5.0E-03	i			5.0E-03	r 0	0.10		68085-85-8	Cyhalothrin/Karate	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		1.0E-02	i			1.0E-02	r 0	0.10		52315-07-8	Cypermethrin	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
		7.5E-03	i			7.5E-03	r 0	0.10		66215-27-8	Cyromazine	4.9E+02	nc	5.1E+03	nc	2.7E+01	nc	2.7E+02	nc
		1.0E-02	i			1.0E-02	r 0	0.10		1861-32-1	Dacthal	3.3E+04	nc	1.0E+05	max	1.8E+03	nc	1.8E+04	nc
		3.0E-02	i			3.0E-02	r 0	0.10		75-99-0	Dalapon	2.0E+03	nc	2.0E+04	nc	1.1E+02	nc	1.1E+03	nc
		5.0E-04	x			5.0E-04	r 0	0.10		39515-41-8	Danitol	3.3E+01	nc	3.4E+02	nc	1.8E+00	nc	1.8E+01	nc
2.4E-01	i			2.4E-01	r		0	0.10		6088-51-3	DDD	1.9E+00	ca	7.9E+00	ca	2.8E-02	ca	2.8E-01	ca
3.4E-01	i			3.4E-01	r		0	0.10		72-55-9	DDE	1.3E+00	ca	5.6E+00	ca	2.0E-02	ca	2.0E-01	ca
3.4E-01	i	5.0E-04	i	3.4E-01	i	5.0E-04	r 0	0.10		50-29-3	DDT	1.3E+00	ca**	5.6E+00	ca*	2.0E-02	ca*	2.0E-01	ca*
		1.0E-02	i			1.0E-02	r 0	0.10		1163-19-5	Decabromodiphenyl ether	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
		4.0E-05	i			4.0E-05	r 0	0.10		8065-48-3	Demeton	2.6E+00	nc	2.7E+01	nc	1.5E-01	nc	1.5E+00	nc
6.1E-02	h			6.1E-02	r		0	0.10		2303-16-4	Diallate	7.3E+00	ca	3.1E+01	ca	1.1E-01	ca	1.1E+00	ca
		9.0E-04	h			9.0E-04	r 0	0.10		333-41-5	Diazinon	5.9E+01	nc	6.1E+02	nc	3.3E+00	nc	3.3E+01	nc
		4.0E-03	o			4.0E-03	r 0	0.10		132-64-9	Dibenzofuran	2.6E+02	nc	2.7E+03	nc	1.5E+01	nc	1.5E+02	nc
		1.0E-02	i			1.0E-02	r 0	0.10		106-37-6	1,4-Dibromobenzene	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
8.4E-02	i	2.0E-02	i	8.4E-02	r	2.0E-02	r 0	0.10		124-48-1	Dibromochloromethane	5.3E+00	ca*	2.3E+01	ca	8.0E-02	ca	1.0E+00	ca
1.4E+00	h	5.7E-05	r	2.4E-03	h	5.7E-05	i 0	0.10		96-12-8	1,2-Dibromo-3-chloropropane	3.2E-01	ca**	1.4E+00	ca*	2.1E-01	nc	4.8E-02	ca*
											"CAL-Modified PRG" (PEA, 1994)	6.0E-02				9.6E-04		4.7E-03	
8.5E+01	i	5.7E-05	r	7.7E-01	i	5.7E-05	h 1	0.10	2.0E+04	106-93-4	1,2-Dibromoethane	5.1E-03	ca**	2.1E-02	ca	8.7E-03	ca*	7.6E-04	ca
		1.0E-01	i			1.0E-01	r 0	0.10		84-74-2	Dibutyl phthalate	6.5E+03	nc	6.8E+04	nc	3.7E+02	nc	3.7E+03	nc
		3.0E-02	i			3.0E-02	r 0	0.10		1918-00-9	Dicamba	2.0E+03	nc	2.0E+04	nc	1.1E+02	nc	1.1E+03	nc
		9.0E-02	i			5.7E-02	x 1	0.10	4.0E+04	95-50-1	1,2-Dichlorobenzene	2.3E+03	sat	2.3E+03	sat	2.1E+02	nc	3.7E+02	nc
							1	0.10	4.0E+04	541-73-1	1,3-Dichlorobenzene	2.8E+03	sat	2.8E+03	sat				
2.4E-02	h	2.3E-01	r	2.4E-02	r	2.3E-01	i 1	0.10	4.4E+04	106-46-7	1,4-Dichlorobenzene	7.4E+00	ca	2.0E+01	ca	2.8E-01	ca	4.7E-01	ca
4.5E-01	i			4.5E-01	r		0	0.10		91-94-1	3,3-Dichlorobenzidine	9.9E-01	ca	4.2E+00	ca	1.5E-02	ca	1.5E-01	ca
9.3E+00	r			9.3E+00	h		1	0.10	1.3E+04	764-41-0	1,4-Dichloro-2-butene	7.6E-03	ca	1.8E-02	ca	7.2E-04	ca	1.2E-03	ca
		2.0E-01	i			5.7E-02	h 1	0.10	1.3E+03	75-71-8	Dichlorodifluoromethane	1.1E+02	nc	3.5E+02	sat	2.1E+02	nc	3.9E+02	nc
		1.0E-01	h			1.4E-01	h 1	0.10	4.3E+03	75-34-3	1,1-Dichloroethane	8.4E+02	nc	3.9E+03	sat	5.2E+02	nc	8.1E+02	nc
9.1E-02	i			9.1E-02	i		1	0.10	6.6E+03	107-06-2	1,2-Dichloroethane (EDC)	4.4E-01	ca	9.8E-01	ca	7.4E-02	ca	1.2E-01	ca
6.0E-01	i	9.0E-03	i	1.8E-01	i	9.0E-03	r 1	0.10	1.0E+03	75-35-4	1,1-Dichloroethylene	3.8E-02	ca	8.2E-02	ca	3.8E-02	ca	4.6E-02	ca
		1.0E-02	h			1.0E-02	r 1	0.10	4.1E+03	156-59-2	1,2-Dichloroethylene (cis)	5.9E+01	nc	2.0E+02	nc	3.7E+01	nc	6.1E+01	nc
		2.0E-02	i			2.0E-02	r 1	0.10	6.1E+03	156-60-5	1,2-Dichloroethylene (trans)	1.7E+02	nc	6.0E+02	nc	7.3E+01	nc	1.2E+02	nc
		9.0E-03	h			9.0E-03	r 1	0.10	6.1E+03	540-59-0	1,2-Dichloroethylene (mixture)	7.5E+01	nc	2.7E+02	nc	3.3E+01	nc	5.5E+01	nc
		3.0E-03	i			3.0E-03	r 0	0.10		120-83-2	2,4-Dichlorophenol	2.0E+02	nc	2.0E+03	nc	1.1E+01	nc	1.1E+02	nc
		8.0E-03	i			8.0E-03	r 0	0.10		94-82-6	4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	5.2E+02	nc	5.5E+03	nc	2.9E+01	nc	2.9E+02	nc
		1.0E-02	i			1.0E-02	r 0	0.10		94-75-7	2,4-Dichlorophenoxyacetic Acid (2,4-D)	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
6.8E-02	h	1.1E-03	r	6.8E-02	r	1.1E-03	i 1	0.10	7.7E+03	78-87-5	1,2-Dichloropropane	6.8E-01	ca*	1.5E+00	ca*	9.9E-02	ca*	1.6E-01	ca*
1.8E-01	h	3.0E-04	i	1.3E-01	h	5.7E-03	i 1	0.10	1.2E+04	542-75-6	1,3-Dichloropropene	5.1E-01	ca	1.2E+00	ca	5.2E-02	ca	8.1E-02	ca

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FOR PLANNING PURPOSES

TOXICITY VALUES							SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF		oRfD		ISF		IRfD	V O C	skin ABS	VF (m^3/kg)	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
1/(mg/kg-d)		(mg/kg-d)		1/(mg/kg-d)		(mg/kg-d)													
		3.0E-03	i			3.0E-03	r	0	0.10		616-23-9	2,3-Dichloropropanol	2.0E+02	nc	2.0E+03	nc	1.1E+01	nc	1.1E+02	nc
2.9E-01	i	5.0E-04	i	2.9E-01	r	1.4E-04	i	0	0.10		62-73-7	Dichlorvos	1.5E+00	ca**	6.6E+00	ca*	2.3E-02	ca*	2.3E-01	ca*
4.4E-01	x			4.4E-01	r			0	0.10		115-32-2	Dicofol	1.0E+00	ca	4.3E+00	ca	1.5E-02	ca	1.5E-01	ca
		3.0E-02	h			5.7E-05	h	1	0.10		77-73-6	Dicyclopentadiene					2.1E-01	nc	4.2E-01	nc
1.6E+01	i	5.0E-05	i	1.6E+01	i	5.0E-05	r	0	0.10		60-57-1	Dieldrin	2.8E-02	ca*	1.2E-01	ca	4.2E-04	ca	4.2E-03	ca
		5.7E-03	h			5.7E-03	x	0	0.10		112-34-5	Diethylene glycol, monobutyl ether	3.7E+02	nc	3.9E+03	nc	2.1E+01	nc	2.1E+02	nc
		2.0E+00	h			2.0E+00	r	0	0.10		111-90-0	Diethylene glycol, monoethyl ether	1.0E+05	max	1.0E+05	max	7.3E+03	nc	7.3E+04	nc
		1.1E-02	h			1.1E-02	r	0	0.10		617-84-5	Diethylformamide	7.2E+02	nc	7.5E+03	nc	4.0E+01	nc	4.0E+02	nc
1.2E-03	i	6.0E-01	i	1.2E-03	r	6.0E-01	r	0	0.10		103-23-1	Di(2-ethylhexyl)adipate	3.7E+02	nc	1.6E+03	nc	5.6E+00	nc	5.6E+01	nc
		8.0E-01	i			8.0E-01	r	0	0.10		84-66-2	Diethyl phthalate	5.2E+04	nc	1.0E+05	max	2.9E+03	nc	2.9E+04	nc
4.7E+03	h			4.7E+03	r			0	0.10		56-53-1	Diethylstilbestrol	9.5E-05	ca	4.1E-04	ca	1.4E-06	ca	1.4E-05	ca
		8.0E-02	i			8.0E-02	r	0	0.10		43222-48-6	Difenzoquat (Avenge)	5.2E+03	nc	5.5E+04	nc	2.9E+02	nc	2.9E+03	nc
		2.0E-02	i			2.0E-02	r	0	0.10		35367-38-5	Diflubenzuron	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		1.1E+01	r			1.1E+01	i	1	0.10		75-37-6	1,1-Difluoroethane					4.2E+04	nc	6.9E+04	nc
		8.0E-02	i			8.0E-02	r	0	0.10		1445-75-6	Diisopropyl methylphosphonate	5.2E+03	nc	5.5E+04	nc	2.9E+02	nc	2.9E+03	nc
		2.0E-02	i			2.0E-02	r	0	0.10		55290-64-7	Dimethipin	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		2.0E-04	i			2.0E-04	r	0	0.10		60-51-5	Dimethoate	1.3E+01	nc	1.4E+02	nc	7.3E-01	nc	7.3E+00	nc
1.4E-02	h			1.4E-02	r			0	0.10		119-90-4	3,3'-Dimethoxybenzidine	3.2E+01	ca	1.4E+02	ca	4.8E-01	ca	4.8E+00	ca
		5.7E-06	r			5.7E-06	x	1	0.10	8.4E+03	124-40-3	Dimethylamine	6.2E-02	nc	2.3E-01	nc	2.1E-02	nc	3.5E-02	nc
		2.0E-03	i			2.0E-03	r	0	0.10		121-69-7	N-N-Dimethylaniline	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
7.5E-01	h			7.5E-01	r			0	0.10		95-68-1	2,4-Dimethylaniline	5.9E-01	ca	2.5E+00	ca	9.0E-03	ca	9.0E-02	ca
5.8E-01	h			5.8E-01	r			0	0.10		21436-96-4	2,4-Dimethylaniline hydrochloride	7.7E-01	ca	3.3E+00	ca	1.2E-02	ca	1.2E-01	ca
9.2E+00	h			9.2E+00	r			0	0.10		119-93-7	3,3'-Dimethylbenzidine	4.8E-02	ca	2.1E-01	ca	7.3E-04	ca	7.3E-03	ca
2.6E+00	x			3.5E+00	x			0	0.10		57-14-7	1,1-Dimethylhydrazine	1.7E-01	ca	7.3E-01	ca	1.9E-03	ca	2.6E-02	ca
3.7E+01	x			3.7E+01	x			0	0.10		540-73-8	1,2-Dimethylhydrazine	1.2E-02	ca	5.2E-02	ca	1.8E-04	ca	1.8E-03	ca
		1.0E-01	h			8.6E-03	i	0	0.10		68-12-2	N,N-Dimethylformamide	6.5E+03	nc	6.8E+04	nc	3.1E+01	nc	3.7E+03	nc
		2.0E-02	i			2.0E-02	r	0	0.10		105-67-9	2,4-Dimethylphenol	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		6.0E-04	i			6.0E-04	r	0	0.10		576-26-1	2,6-Dimethylphenol	3.9E+01	nc	4.1E+02	nc	2.2E+00	nc	2.2E+01	nc
		1.0E-03	i			1.0E-03	r	0	0.10		95-65-8	3,4-Dimethylphenol	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc
		1.0E+01	h			1.0E+01	r	0	0.10		131-11-3	Dimethyl phthalate	1.0E+05	max	1.0E+05	max	3.7E+04	nc	3.7E+05	nc
		1.0E-01	i			1.0E-01	r	0	0.10		120-61-6	Dimethyl terephthalate	6.5E+03	nc	6.8E+04	nc	3.7E+02	nc	3.7E+03	nc
		2.0E-03	i			2.0E-03	r	0	0.10		131-89-5	4,6-Dinitro-o-cyclohexyl phenol	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
		1.0E-04	i			1.0E-04	r	0	0.10		99-65-0	1,3-Dinitrobenzene	6.5E+00	nc	6.8E+01	nc	3.7E-01	nc	3.7E+00	nc
		4.0E-04	h			4.0E-04	r	0	0.10		528-29-0	1,2-Dinitrobenzene	2.6E+01	nc	2.7E+02	nc	1.5E+00	nc	1.5E+01	nc
		4.0E-04	h			4.0E-04	r	0	0.10		100-25-4	1,4-Dinitrobenzene	2.6E+01	nc	2.7E+02	nc	1.5E+00	nc	1.5E+01	nc
		2.0E-03	i			2.0E-03	r	0	0.10		51-28-5	2,4-Dinitrophenol	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
6.8E-01	i			6.8E-01	r			0	0.10		25321-14-6	Dinitrotoluene mixture	6.5E-01	ca	2.8E+00	ca	9.9E-03	ca	9.9E-02	ca
		2.0E-03	i			2.0E-03	r	0	0.10		121-14-2	2,4-Dinitrotoluene	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
		1.0E-03	h			1.0E-03	r	0	0.10		606-20-2	2,6-Dinitrotoluene	6.5E+01	ca*	6.8E+02	ca	3.7E+00	ca	3.7E+01	ca

Key: I=IRIS h=HEAST e=ECAO x=WITHDRAWN r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(nc < 100X ca) **(nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY VALUES								SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF		oRfD		iSF		IRfD		V O C	skin ABS	VF	CAS No.		Residential Soil		Industrial Soil		Ambient Air		Tap Water	
1/(mg/kg-d)		(mg/kg-d)		1/(mg/kg-d)		(mg/kg-d)				(m^3/kg)			(mg/kg)		(mg/kg)		(ug/m^3)		(ug/l)	
		1.0E-03	i			1.0E-03	r	0	0.10		88-85-7	Dinoseb	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc
		2.0E-02	h			2.0E-02	r	0	0.10		117-84-0	di-n-Octyl phthalate	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
1.1E-02	i			1.1E-02	r			1	0.10	3.6E+04	123-91-1	1,4-Dioxane	1.4E+01	ca	3.7E+01	ca	6.1E-01	ca	1.0E+00	ca
		3.0E-02	i			3.0E-02	r	0	0.10		957-51-7	Diphenamid	2.0E+03	nc	2.0E+04	nc	1.1E+02	nc	1.1E+03	nc
		2.5E-02	i			2.5E-02	r	0	0.10		122-39-4	Diphenylamine	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc
8.0E-01	i			7.7E-01	i			0	0.10		122-66-7	1,2-Diphenylhydrazine	5.6E-01	ca	2.4E+00	ca	8.7E-03	ca	8.4E-02	ca
		2.2E-03	i			2.2E-03	r	0	0.10		85-00-7	Diquat	1.4E+02	nc	1.5E+03	nc	8.0E+00	nc	8.0E+01	nc
8.6E+00	h			8.6E+00	r			0	0.10		1937-37-7	Direct black 38	5.2E-02	ca	2.2E-01	ca	7.8E-04	ca	7.8E-03	ca
8.1E+00	h			8.1E+00	r			0	0.10		2602-46-2	Direct blue 6	5.5E-02	ca	2.4E-01	ca	8.3E-04	ca	8.3E-03	ca
9.3E+00	h			9.3E+00	r			0	0.10		16071-86-6	Direct brown 95	4.8E-02	ca	2.1E-01	ca	7.2E-04	ca	7.2E-03	ca
		4.0E-05	i			4.0E-05	r	0	0.10		298-04-4	Disulfoton	2.6E+00	nc	2.7E+01	nc	1.5E-01	nc	1.5E+00	nc
		1.0E-02	i			1.0E-02	r	0	0.10		505-29-3	1,4-Dithiane	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
		2.0E-03	i			2.0E-03	r	0	0.10		330-54-1	Diuron	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
		4.0E-03	i			4.0E-03	r	0	0.10		2439-10-3	Dodine	2.6E+02	nc	2.7E+03	nc	1.5E+01	nc	1.5E+02	nc
		5.0E-05	h			5.0E-05	r	0	0.10		115-29-7	Endosulfan	3.3E+00	nc	3.4E+01	nc	1.8E-01	nc	1.8E+00	nc
		2.0E-02	i			2.0E-02	r	0	0.10		145-73-3	Endothall	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		3.0E-04	i			3.0E-04	r	0	0.10		72-20-8	Endrin	2.0E+01	nc	2.0E+02	nc	1.1E+00	nc	1.1E+01	nc
9.9E-03	i	2.0E-03	h	4.2E-03	i	2.9E-04	i	1	0.10	2.1E+04	106-89-8	Epichlorohydrin	8.6E+00	nc	3.0E+01	nc	1.0E+00	nc	2.0E+00	nc
		5.7E-03	r			5.7E-03	i	0	0.10		106-88-7	1,2-Epoxybutane	3.7E+02	nc	3.9E+03	nc	2.1E+01	nc	2.1E+02	nc
		2.5E-02	i			2.5E-02	r	0	0.10		759-94-4	EPTC (S-Ethyl dipropylthiocarbamate)	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc
		5.0E-03	i			5.0E-03	r	0	0.10		16672-87-0	Ethephon (2-chloroethyl phosphonic acid)	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		5.0E-04	i			5.0E-04	r	0	0.10		563-12-2	Ethion	3.3E+01	nc	3.4E+02	nc	1.8E+00	nc	1.8E+01	nc
		4.0E-01	h			5.7E-02	i	0	0.10		110-80-5	2-Ethoxyethanol	2.6E+04	nc	1.0E+05	max	2.1E+02	nc	1.5E+04	nc
		3.0E-01	h			3.0E-01	r	0	0.10		111-15-9	2-Ethoxyethanol acetate	2.0E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc
		9.0E-01	i			9.0E-01	r	0	0.10		141-78-6	Ethyl acetate	5.9E+04	nc	1.0E+05	max	3.3E+03	nc	3.3E+04	nc
4.8E-02	h			4.8E-02	r			1	0.10	3.5E+03	140-88-5	Ethyl acrylate	4.6E-01	ca	1.0E+00	ca	1.4E-01	ca	2.3E-01	ca
		1.0E-01	i			2.9E-01	i	1	0.10	1.1E+04	100-41-4	Ethylbenzene	2.9E+03	sat	3.1E+03	sat	1.1E+03	nc	1.3E+03	nc
		3.0E-01	h			3.0E-01	r	0	0.10		109-78-4	Ethylene cyanohydrin	2.0E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc
		2.0E-02	h			2.0E-02	r	0	0.10		107-15-3	Ethylene diamine	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		2.0E+00	i			2.0E+00	r	0	0.10		107-21-1	Ethylene glycol	1.3E+05	nc	1.0E+05	max	7.3E+03	nc	7.3E+04	nc
		5.7E-03	r			5.7E-03	h	0	0.10		111-76-2	Ethylene glycol, monobutyl ether	3.7E+02	nc	3.9E+03	nc	2.1E+01	nc	2.1E+02	nc
1.0E+00	h			3.5E-01	h			1	0.10	8.9E+03	75-21-8	Ethylene oxide	1.2E-01	ca	3.0E-01	ca	1.9E-02	ca	2.4E-02	ca
6.0E-01	h	8.0E-05	i	6.0E-01	r	8.0E-05	r	0	0.10		96-45-7	Ethylene thiourea (ETU)	7.4E-01	ca**	3.2E+00	ca*	1.1E-02	ca*	1.1E-01	ca*
		2.0E-02	e			2.9E+00	i	1	0.10	1.9E+03	75-00-3	Ethyl chloride	1.1E+03	nc	2.2E+03	sat	1.0E+04	nc	7.1E+02	nc
		2.0E-01	i			2.0E-01	r	1	0.10	7.3E+04	60-29-7	Ethyl ether	3.8E+03	sat	3.8E+03	sat	7.3E+02	nc	1.2E+03	nc
		9.0E-02	h			9.0E-02	r	1	0.10	3.5E+03	97-63-2	Ethyl methacrylate	3.4E+02	sat	3.4E+02	sat	3.3E+02	nc	5.5E+02	nc
		1.0E-05	i			1.0E-05	r	0	0.10		2104-64-5	Ethyl p-nitrophenyl phenylphosphorothioate	6.5E-01	nc	6.8E+00	nc	3.7E-02	nc	3.7E-01	nc
		3.0E+00	i			3.0E+00	r	0	0.10		84-72-0	Ethylphthalyl ethyl glycolate	1.0E+05	max	1.0E+05	max	1.1E+04	nc	1.1E+05	nc
		8.0E-03	i			8.0E-03	r	0	0.10		101200-48-0	Express	5.2E+02	nc	5.5E+03	nc	2.9E+01	nc	2.9E+02	nc

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FOR PLANNING PURPOSES

TOXICITY VALUES						SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF 1/(mg/kg-d)		oRfD (mg/kg-d)		ISF 1/(mg/kg-d)		IRfD (mg/kg-d)		V O C	skin ABS	VF (m^3/kg)	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
		2.5E-04	i			2.5E-04	r	0	0.10		22224-92-6	Fenamiphos	1.6E+01	nc	1.7E+02	nc	9.1E-01	nc	9.1E+00	nc
		1.3E-02	i			1.3E-02	r	0	0.10		2164-17-2	Fluometuron	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc
		6.0E-02	i			6.0E-02	r	0	0.10		7782-41-4	Fluoride	3.9E+03	nc	4.1E+04	nc	2.2E+02	nc	2.2E+03	nc
		8.0E-02	i			8.0E-02	r	0	0.10		59756-60-4	Fluoridone	5.2E+03	nc	5.5E+04	nc	2.9E+02	nc	2.9E+03	nc
		2.0E-02	i			2.0E-02	r	0	0.10		56425-91-3	Flurprimidol	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		6.0E-02	i			6.0E-02	r	0	0.10		66332-96-5	Flutolanil	3.9E+03	nc	4.1E+04	nc	2.2E+02	nc	2.2E+03	nc
		1.0E-02	i			1.0E-02	r	0	0.10		69409-94-5	Fluvalinate	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
3.5E-03	i	1.0E-01	i	3.5E-03	r	1.0E-01	r	0	0.10		133-07-3	Folpet	1.3E+02	ca*	5.5E+02	ca	1.9E+00	ca	1.9E+01	ca
1.9E-01	i			1.9E-01	r			0	0.10		72178-02-0	Fomesafen	2.3E+00	ca	1.0E+01	ca	3.5E-02	ca	3.5E-01	ca
		2.0E-03	i			2.0E-03	r	0	0.10		944-22-9	Fonofos	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
		1.5E-01	i	4.6E-02	i			0	0.10		50-00-0	Formaldehyde	9.8E+03	nc	1.0E+05	nc	1.5E-01	ca	5.5E+03	nc
		2.0E+00	h			2.0E+00	r	0	0.10		64-18-6	Formic Acid	1.3E+05	nc	1.0E+05	max	7.3E+03	nc	7.3E+04	nc
		3.0E+00	i			3.0E+00	r	0	0.10		39148-24-8	Fosetyl-al	1.0E+05	max	1.0E+05	max	1.1E+04	nc	1.1E+05	nc
		1.0E-03	i			1.0E-03	r	0	0.10		110-00-9	Furan	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc
3.8E+00	h							0	0.10		67-45-8	Furazolidone	1.2E-01	ca	5.0E-01	ca	1.0E+09	ca	1.8E-02	ca
		3.0E-03	i			1.4E-02	h	0	0.10		98-01-1	Furfural	2.0E+02	nc	2.0E+03	nc	5.2E+01	nc	1.1E+02	nc
5.0E+01	h			5.0E+01	r			0	0.10		531-82-8	Furium	8.9E-03	ca	3.8E-02	ca	1.3E-04	ca	1.3E-03	ca
3.0E-02	i			3.0E-02	r			0	0.10		60568-05-0	Furmecyclox	1.5E+01	ca	6.4E+01	ca	2.2E-01	ca	2.2E+00	ca
		4.0E-04	i			4.0E-04	r	0	0.10		51276-47-2	Glufosinate-ammonium	2.6E+01	nc	2.7E+02	nc	1.5E+00	nc	1.5E+01	nc
		4.0E-04	i			2.9E-04	h	0	0.10		765-34-4	Glycidaldehyde	2.6E+01	nc	2.7E+02	nc	1.0E+00	nc	1.5E+01	nc
		1.0E-01	i			1.0E-01	r	0	0.10		1071-83-6	Glyphosate	6.5E+03	nc	6.8E+04	nc	3.7E+02	nc	3.7E+03	nc
		5.0E-05	i			5.0E-05	r	0	0.10		69806-40-2	Haloxyfop-methyl	3.3E+00	nc	3.4E+01	nc	1.8E-01	nc	1.8E+00	nc
		1.3E-02	i			1.3E-02	r	0	0.10		74223-64-6	Harmony	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc
4.5E+00	i	5.0E-04	i	4.6E+00	i	5.0E-04	r	0	0.10		76-44-8	Heptachlor	9.9E-02	ca	4.2E-01	ca	1.5E-03	ca	1.5E-02	ca
9.1E+00	i	1.3E-05	i	9.1E+00	i	1.3E-05	r	0	0.10		1024-57-3	Heptachlor epoxide	4.9E-02	ca**	2.1E-01	ca*	7.4E-04	ca*	7.4E-03	ca*
		2.0E-03	i			2.0E-03	r	0	0.10		87-82-1	Hexabromobenzene	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
1.6E+00	i	8.0E-04	i	1.6E+00	i	8.0E-04	r	0	0.10		118-74-1	Hexachlorobenzene	2.8E-01	ca*	1.2E+00	ca	4.2E-03	ca	4.2E-02	ca
7.8E-02	i	2.0E-04	h	7.7E-02	i	2.0E-04	r	0	0.10		87-68-3	Hexachlorobutadiene	5.7E+00	ca**	2.4E+01	ca*	8.7E-02	ca*	8.6E-01	ca*
6.3E+00	i			6.3E+00	i			0	0.10		319-84-6	HCH (alpha)	7.1E-02	ca	3.0E-01	ca	1.1E-03	ca	1.1E-02	ca
1.8E+00	i			1.8E+00	i			0	0.10		319-85-7	HCH (beta)	2.5E-01	ca	1.1E+00	ca	3.7E-03	ca	3.7E-02	ca
1.3E+00	h	3.0E-04	i	1.3E+00	r	3.0E-04	r	0	0.10		58-89-9	HCH (gamma) Lindane	3.4E-01	ca*	1.5E+00	ca	5.2E-03	ca	5.2E-02	ca
1.8E+00	i			1.8E+00	i			0	0.10		58-89-9	HCH-technical	2.5E-01	ca	1.1E+00	ca	3.8E-03	ca	3.7E-02	ca
		7.0E-03	i			2.0E-05	h	0	0.10		77-47-4	Hexachlorocyclopentadiene	4.5E+02	nc	4.7E+03	nc	7.3E-02	nc	2.6E+02	nc
6.2E+03	i			4.6E+03	i			0	0.10		19408-74-3	Hexachlorodibenzo-p-dioxin mixture (HxCDD	7.2E-05	ca	3.1E-04	ca	1.5E-06	ca	1.1E-05	ca
1.4E-02	i	1.0E-03	i	1.4E-02	i	1.0E-03	r	0	0.10		67-72-1	Hexachloroethane	3.2E+01	nc	1.4E+02	ca	4.8E-01	ca	4.8E+00	ca
		3.0E-04	i			3.0E-04	r	0	0.10		70-30-4	Hexachlorophene	2.0E+01	nc	2.0E+02	nc	1.1E+00	nc	1.1E+01	nc
1.1E-01	i	3.0E-03	i	1.1E-01	r	3.0E-03	r	0	0.10		121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	4.0E+00	ca*	1.7E+01	ca	6.1E-02	ca	6.1E-01	ca
		2.9E-06	r			2.9E-06	i	0	0.10		822-06-0	1,6-Hexamethylene diisocyanate					1.0E-02	nc	1.0E-01	nc
		6.0E-02	h			5.7E-02	i	1	0.10		110-54-3	n-Hexane					2.1E+02	nc	3.5E+02	nc

Key : i=IRIS h=HEAST e=HEAST x=WITHDRAWN r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(nc < 100X ca) **(nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY VALUES							SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF		oRfD		iSF		iRfD		V O C	skin ABS	VF (m^3/kg)	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
1/(mg/kg-d)		(mg/kg-d)		1/(mg/kg-d)		(mg/kg-d)														
		3.3E-02	i			3.3E-02	r	0	0.10		51235-04-2	Hexazinone	2.2E+03	nc	2.2E+04	nc	1.2E+02	nc	1.2E+03	nc
3.0E+00	i			1.7E+01	i			0	0.10		302-01-2	Hydrazine, hydrazine sulfate	1.5E-01	ca	6.4E-01	ca	3.9E-04	ca	2.2E-02	ca
						2.0E-03	i	0	0.10		7647-01-0	Hydrogen chloride					7.3E+00	nc		
		3.0E-03	i			2.6E-04	i	1	0.10		7783-06-4	Hydrogen sulfide					9.4E-01	nc	1.8E+00	nc
		4.0E-02	h			4.0E-02	r	0	0.10		123-31-9	p-Hydroquinone	2.6E+03	nc	2.7E+04	nc	1.5E+02	nc	1.5E+03	nc
		1.3E-02	i			1.3E-02	r	0	0.10		35554-44-0	Imazalil	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc
		2.5E-01	i			2.5E-01	r	0	0.10		81335-37-7	Imazaquin	1.6E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc
		4.0E-02	i			4.0E-02	r	0	0.10		36734-19-7	Iprodione	2.6E+03	nc	2.7E+04	nc	1.5E+02	nc	1.5E+03	nc
		3.0E-01	i			3.0E-01	r	0	0.10		78-83-1	Isobutanol	2.0E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc
9.5E-04	i	2.0E-01	i	9.5E-04	r	2.0E-01	r	0	0.10		78-59-1	Isophorone	4.7E+02	ca**	2.0E+03	ca*	7.1E+00	ca*	7.1E+01	ca*
		1.5E-02	i			1.5E-02	r	0	0.10		33820-53-0	Isopropalin	9.8E+02	nc	1.0E+04	nc	5.5E+01	nc	5.5E+02	nc
		1.0E-01	i			1.1E-01	r	0	0.10		1832-54-8	Isopropyl methyl phosphonic acid	6.5E+03	nc	6.8E+04	nc	4.0E+02	nc	3.7E+03	nc
		5.0E-02	i			5.0E-02	r	0	0.10		82558-50-7	Isoxaben	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
1.8E+01	e			1.8E+01	r			0	0.10		143-50-0	Kepone	2.5E-02	ca	1.1E-01	ca	3.7E-04	ca	3.7E-03	ca
		2.0E-03	i			2.0E-03	r	0	0.10		77501-63-4	Lactofen	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
Residential PRG Based on Uptake Biokinetic Model								0	NA		7439-92-1	Lead	4.0E+02	nc	1.0E+03	nc			4.0E+00	nc
												"CAL-Modified PRG" (PEA, 1994)	1.3E+02	nc						
		1.0E-07	i					0	0.10		78-00-2	Lead (tetraethyl)	6.5E-03	nc	6.8E-02	nc			3.7E-03	nc
		2.0E-03	i			2.0E-03	r	0	0.10		330-55-2	Linuron	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
		2.0E-02	e					0	0.01		7439-93-2	Lithium	1.5E+03	nc	3.4E+04	nc			7.3E+02	nc
		2.0E-01	i			2.0E-01	r	0	0.10		83055-99-6	Londax	1.3E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc
		2.0E-02	i			2.0E-02	r	0	0.10		121-75-5	Malathion	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		1.0E-01	i			1.0E-01	r	0	0.10		108-31-6	Maleic anhydride	6.5E+03	nc	6.8E+04	nc	3.7E+02	nc	3.7E+03	nc
		5.0E-01	i			5.0E-01	r	0	0.10		123-33-1	Maleic hydrazide	3.3E+04	nc	1.0E+05	max	1.8E+03	nc	1.8E+04	nc
		2.0E-05	h			2.0E-05	r	0	0.10		109-77-3	Malononitrile	1.3E+00	nc	1.4E+01	nc	7.3E-02	nc	7.3E-01	nc
		3.0E-02	h			3.0E-02	r	0	0.10		8018-01-7	Mancozeb	2.0E+03	nc	2.0E+04	nc	1.1E+02	nc	1.1E+03	nc
		5.0E-03	i			5.0E-03	r	0	0.10		12427-38-2	Maneb	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		5.0E-03	i			1.4E-05	i	0	0.01		7439-96-5	Manganese and compounds	3.8E+02	nc	8.3E+03	nc	5.1E-02	nc	1.8E+02	nc
		9.0E-05	h			9.0E-05	r	0	0.10		950-10-7	Mephosfolan	5.9E+00	nc						
		3.0E-02	i			3.0E-02	r	0	0.10		24307-26-4	Mepiquat	2.0E+03	nc						
		3.0E-04	i					0	0.10		22967-92-6	Mercury (methyl)	2.0E+01	nc						
		3.0E-04	h			8.6E-05	h	0	0.01		7439-97-6	Mercury (inorganic)	2.3E+01	nc	5.1E+02	nc	3.1E-01	nc	1.1E+01	nc
		3.0E-05	i			3.0E-05	r	0	0.10		150-50-5	Merphos	2.0E+00	nc	2.0E+01	nc	1.1E-01	nc	1.1E+00	nc
		3.0E-05	i			3.0E-05	r	0	0.10		814-29-9	Merphos oxide	2.0E+00	nc	2.0E+01	nc	1.1E-01	nc	1.1E+00	nc
		6.0E-02	i			6.0E-02	r	0	0.10		57837-19-1	Metalaxyl	3.9E+03	nc	4.1E+04	nc	2.2E+02	nc	2.2E+03	nc
		1.0E-04	i			2.0E-04	h	1	0.10	5.4E+03	126-98-7	Methacrylonitrile	1.3E+00	nc	5.1E+00	nc	7.3E-01	nc	1.0E+00	nc
		5.0E-05	i			5.0E-05	r	0	0.10		10265-92-6	Methamidophos	3.3E+00	nc	3.4E+01	nc	1.8E-01	nc	1.8E+00	nc
		5.0E-01	i			5.0E-01	r	0	0.10		67-56-1	Methanol	3.3E+04	nc	1.0E+05	max	1.8E+03	nc	1.8E+04	nc
		1.0E-03	i			1.0E-03	r	0	0.10		950-37-8	Methidathion	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc

Key: i=IRIS h=HEAST e=ECAO x=WITHDRAWN r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(nc < 100X ca) **(nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY VALUES							SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF		oRfD		iSF		iRfD	VOC	skin ABS	VF	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
1/(mg/kg-d)		(mg/kg-d)		1/(mg/kg-d)		(mg/kg-d)			(m^3/kg)										
		2.5E-02	i			2.5E-02	r	0	0.10		16752-77-5	Methomyl	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc
		5.0E-03	i			5.0E-03	r	0	0.10		72-43-5	Methoxychlor	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		1.0E-03	h			5.7E-03	i	0	0.10		109-86-4	2-Methoxyethanol	6.5E+01	nc	6.8E+02	nc	2.1E+01	nc	3.7E+01	nc
		2.0E-03	h			2.0E-03	r	0	0.10		110-49-6	2-Methoxyethanol acetate	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
4.6E-02	h			4.6E-02	r			0	0.10		99-59-2	2-Methoxy-5-nitroaniline	9.7E+00	ca	4.1E+01	ca	1.5E-01	ca	1.5E+00	ca
		1.0E+00	h			1.0E+00	r	1	0.10	1.9E+04	79-20-9	Methyl acetate	2.0E+04	nc	8.4E+04	nc	3.7E+03	nc	6.1E+03	nc
		3.0E-02	h			3.0E-02	r	1	0.10	3.5E+03	96-33-3	Methyl acrylate	1.5E+02	nc	5.2E+02	nc	1.1E+02	nc	1.8E+02	nc
2.4E-01	h			2.4E-01	r			0	0.10		100-61-8	2-Methylaniline (o-toluidine)	1.9E+00	ca	7.9E+00	ca	2.8E-02	ca	2.8E-01	ca
1.8E-01	h			1.8E-01	r			0	0.10		636-21-5	2-Methylaniline hydrochloride	2.5E+00	ca	1.1E+01	ca	3.7E-02	ca	3.7E-01	ca
		1.0E+00	x			1.0E+00	r	0	0.10		79-22-1	Methyl chlorocarbonate	6.5E+04	nc	1.0E+05	max	3.7E+03	nc	3.7E+04	nc
		5.0E-04	i			5.0E-04	r	0	0.10		94-74-6	2-Methyl-4-chlorophenoxyacetic acid	3.3E+01	nc	3.4E+02	nc	1.8E+00	nc	1.8E+01	nc
		1.0E-02	i			1.0E-02	r	0	0.10		94-81-5	4-(2-Methyl-4-chlorophenoxy) butyric acid (M	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
		1.0E-03	i			1.0E-03	r	0	0.10		93-65-2	2-(2-Methyl-4-chlorophenoxy) propionic acid	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc
		1.0E-03	i			1.0E-03	r	0	0.10		16484-77-8	2-(2-Methyl-1,4-chlorophenoxy) propionic aci	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc
		8.6E-01	r			8.6E-01	h	0	0.10		108-87-2	Methylcyclohexane	5.6E+04	nc	1.0E+05	max	3.1E+03	nc	3.1E+04	nc
		5.7E-06	r			5.7E-06	h	0	0.10		101-68-8	4,4'-Methylenediphenyl isocyanate	3.7E-01	nc	3.9E+00	nc	2.1E-02	nc	2.1E-01	nc
2.5E-01	h			2.5E-01	r			0	0.10		101-77-9	4,4'-Methylenebisbenzeneamine	1.8E+00	ca	7.6E+00	ca	2.7E-02	ca	2.7E-01	ca
1.3E-01	h	7.0E-04	h	1.3E-01	h	7.0E-04	r	0	0.10		101-14-4	4,4'-Methylene bis(2-chloroaniline)	3.4E+00	ca**	1.5E+01	ca*	5.2E-02	ca	5.2E-01	ca
4.6E-02	i			4.6E-02	r			0	0.10		101-61-1	4,4'-Methylene bis(N,N'-dimethyl)aniline	9.7E+00	ca	4.1E+01	ca	1.5E-01	ca	1.5E+00	ca
		1.0E-02	h			1.0E-02	r	0	0.10		74-95-3	Methylene bromide	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
7.5E-03	i	6.0E-02	i	1.6E-03	i	8.6E-01	h	1	0.10	3.3E+03	75-09-2	Methylene chloride	1.1E+01	ca	2.5E+01	ca	4.1E+00	ca	4.3E+00	ca
						5.7E-06	i	0	NA		101-68-8	4,4'-Methylenediphenyl isocyanate					2.1E-02	ca		
		6.0E-01	i			2.9E-01	i	1	0.10	2.5E+04	78-93-3	Methyl ethyl ketone	8.7E+03	nc	3.4E+04	nc	1.0E+03	nc	1.9E+03	nc
1.1E+00	h			1.1E+00	r			0	0.10		60-34-4	Methyl hydrazine	4.0E-01	ca	1.7E+00	ca	6.1E-03	ca	6.1E-02	ca
		8.0E-02	h			2.3E-02	h	0	0.10		108-10-1	Methyl isobutyl ketone	5.2E+03	nc	5.5E+04	nc	8.3E+01	nc	2.9E+03	nc
		8.0E-02	h			8.0E-02	r	0	0.10		80-62-6	Methyl methacrylate	5.2E+03	nc	5.5E+04	nc	2.9E+02	nc	2.9E+03	nc
3.3E-02	h			3.3E-02	r			0	0.10		99-55-8	2-Methyl-5-nitroaniline	1.3E+01	ca	5.8E+01	ca	2.0E-01	ca	2.0E+00	ca
		2.5E-04	i			2.5E-04	r	0	0.10		298-00-0	Methyl parathion	1.6E+01	nc	1.7E+02	nc	9.1E-01	nc	9.1E+00	nc
		5.0E-02	x			5.0E-02	r	0	0.10		95-48-7	2-Methylphenol	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
		5.0E-02	x			5.0E-02	r	0	0.10		108-39-4	3-Methylphenol	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
		5.0E-03	h			5.0E-03	r	0	0.10		106-44-5	4-Methylphenol	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		6.0E-03	h			1.1E-02	h	1	0.10	2.7E+04	25013-15-4	Methyl styrene (mixture)	2.2E+02	nc	1.2E+03	nc	4.2E+01	nc	6.0E+01	nc
		7.0E-02	h			7.0E-02	r	1	0.10	2.7E+04	98-83-9	Methyl styrene (alpha)	1.8E+03	nc	8.1E+03	nc	2.6E+02	nc	4.3E+02	nc
		5.0E-03	e			8.6E-01	i	0	0.10		1634-04-4	Methyl tertbutyl ether (MTBE)	3.3E+02	nc	3.4E+03	nc	3.1E+03	nc	1.8E+02	nc
		1.5E-01	i			1.5E-01	r	0	0.10		51218-45-2	Metolaclor (Dual)	9.8E+03	nc	1.0E+05	max	5.5E+02	nc	5.5E+03	nc
		2.5E-02	i			2.5E-02	r	0	0.10		21087-64-9	Metribuzin	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc
1.8E+00	h	2.0E-04	i	1.8E+00	r	2.0E-04	r	0	0.10		2385-85-5	Mirex	2.5E-01	ca*	1.1E+00	ca	3.7E-03	ca	3.7E-02	ca
		2.0E-03	i			2.0E-03	r	0	0.10		2212-67-1	Molinate	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
		5.0E-03	h			5.0E-03	r	0	0.01		7439-98-7	Molybdenum	3.8E+02	nc	8.5E+03	nc	1.8E+01	nc	1.8E+02	nc

Key: i=IRIS h=HEAST e=ECAO x=WITHDRAWN r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(nc < 100X ca) **(nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY VALUES								SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF		oRfD		ISF		IRfD		V O C	skin ABS	VF (m^3/kg)	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
1/(mg/kg-d)		(mg/kg-d)		1/(mg/kg-d)		(mg/kg-d)														
		1.0E-01	h			1.0E-01	h	0	0.10		10599-90-3	Monochloramine	6.5E+03	nc	6.8E+04	nc	3.7E+02	nc	3.7E+03	nc
		2.0E-03	i			2.0E-03	r	0	0.10		300-76-5	Naled	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
		1.0E-01	i			1.0E-01	r	0	0.10		15299-99-7	Napropamide	6.5E+03	nc	6.8E+04	nc	3.7E+02	nc	3.7E+03	nc
		2.0E-02	i					0	0.01		7440-02-0	Nickel (soluble salts)	1.5E+03	nc	3.4E+04	nc			7.3E+02	nc
												"CAL-Modified PRG" (PEA, 1994)	1.5E+02							
				8.4E-01	i			0	0.01		n/a	Nickel refinery dust					8.0E-03	ca		
				1.7E+00	i			0	0.01		12035-72-2	Nickel subsulfide			3.9E+04	ca	4.0E-03	ca		
		1.5E-03	x			1.5E-03	r	0	0.10		1929-82-4	Nitrapyrin	9.8E+01	nc	1.0E+03	nc	5.5E+00	nc	5.5E+01	nc
		1.6E+00	i					0	0.10		14797-55-8	Nitrate	1.0E+05	max	1.0E+05	max			5.8E+04	nc
		1.0E-01	x					0	0.10		10102-43-9	Nitric Oxide	6.5E+03	nc	1.0E+05	max			3.7E+03	nc
		1.0E-01	i					0	0.10		14797-65-0	Nitrite	6.5E+03	nc	1.0E+05	max			3.7E+03	nc
		6.0E-05	r			5.7E-05	h	0	0.10		88-74-4	2-Nitroaniline	3.9E+00	nc	4.1E+01	nc	2.1E-01	nc	2.2E+00	nc
								0	0.10		99-09-2	3-Nitroaniline								
								0	0.10		100-01-6	4-Nitroaniline								
		5.0E-04	i			5.7E-04	h	0	0.10		98-95-3	Nitrobenzene	3.3E+01	nc	3.4E+02	nc	2.1E+00	nc	1.8E+01	nc
		7.0E-02	h			7.0E-02	r	0	0.10		67-20-9	Nitrofurantoin	4.6E+03	nc	4.8E+04	nc	2.6E+02	nc	2.6E+03	nc
1.5E+00	h			9.4E+00	h			0	0.10		59-87-0	Nitrofurazone	3.0E-01	ca	1.3E+00	ca	7.2E-04	ca	4.5E-02	ca
		1.0E+00	x					0	0.10		101102-44-0	Nitrogen dioxide								
		1.0E-01	i			1.0E-01	r	0	0.10		556-88-7	Nitroguanidine	6.5E+03	nc	6.8E+04	nc	3.7E+02	nc	3.7E+03	nc
								0	0.10		1000-02-7	4-Nitrophenol								
9.4E+00	r	5.7E-03	r	9.4E+00	h	5.7E-03	i	1	0.10		79-46-9	2-Nitropropane					7.2E-04	ca	3.5E+01	ca
5.4E+00	i			5.6E+00	i			0	0.10		924-16-3	N-Nitrosodi-n-butylamine	8.2E-02	ca	3.5E-01	ca	1.2E-03	ca	1.2E-02	ca
2.8E+00	i			2.8E+00	r			0	0.10		1116-54-7	N-Nitrosodiethanolamine	1.6E-01	ca	6.8E-01	ca	2.4E-03	ca	2.4E-02	ca
1.5E+02	i			1.5E+02	i			0	0.10		55-18-5	N-Nitrosodiethylamine	3.0E-03	ca	1.3E-02	ca	4.5E-05	ca	4.5E-04	ca
5.1E+01	i			4.9E+01	i			0	0.10		62-75-9	N-Nitrosodimethylamine	8.7E-03	ca	3.7E-02	ca	1.4E-04	ca	1.3E-03	ca
4.9E-03	i			4.9E-03	r			0	0.10		156-10-5	N-Nitrosodiphenylamine	9.1E+01	ca	3.9E+02	ca	1.4E+00	ca	1.4E+01	ca
7.0E+00	i			7.0E+00	r			0	0.10		621-64-7	N-Nitroso di-n-propylamine	6.3E-02	ca	2.7E-01	ca	9.6E-04	ca	9.6E-03	ca
2.2E+01	i			2.2E+01	r			0	0.10		10595-95-6	N-Nitroso-N-methylethylamine	2.0E-02	ca	8.7E-02	ca	3.1E-04	ca	3.1E-03	ca
2.1E+00	i			2.1E+00	i			0	0.10		930-55-2	N-Nitrosopyrrolidine	2.1E-01	ca	9.1E-01	ca	3.1E-03	ca	3.2E-02	ca
		1.0E-02	h			1.0E-02	r	0	0.10		99-08-1	m-Nitrotoluene	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
		1.0E-02	h			1.0E-02	r	0	0.10		99-99-0	p-Nitrotoluene	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
		4.0E-02	i			4.0E-02	r	0	0.10		27314-13-2	Norflurazon								
		7.0E-04	i			7.0E-04	r	0	0.10		85509-19-9	NuStar	4.6E+01	nc	4.8E+02	nc	2.6E+00	nc	2.6E+01	nc
		3.0E-03	i			3.0E-03	r	0	0.10		32536-52-0	Octabromodiphenyl ether	2.0E+02	nc	2.0E+03	nc	1.1E+01	nc	1.1E+02	nc
		5.0E-02	i			5.0E-02	r	0	0.10		2691-41-0	Octahydro-1357-tetranitro-1357- tetrazocine (	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
		2.0E-03	h			2.0E-03	r	0	0.10		152-16-9	Octamethylpyrophosphoramide	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
		5.0E-02	i			5.0E-02	r	0	0.10		19044-88-3	Oryzalin	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
		5.0E-03	i			5.0E-03	r	0	0.10		19666-30-9	Oxadiazon	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		2.5E-02	i			2.5E-02	r	0	0.10		23135-22-0	Oxamyl	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc

Key : I=IRIS h=HEAST e=HEAST c=CAL x=WITHDRAWN r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(nc < 100X ca) **(nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY VALUES								SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF		oRfD		ISF		IRfD		VO C	skin ABS	VF (m^3/kg)	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
1/(mg/kg-d)		(mg/kg-d)		1/(mg/kg-d)		(mg/kg-d)														
		3.0E-03	i			3.0E-03	r	0	0.10		42874-03-3	Oxyfluorfen	2.0E+02	nc	2.0E+03	nc	1.1E+01	nc	1.1E+02	nc
		1.3E-02	i			1.3E-02	r	0	0.10		76738-62-0	Paclobutrazol	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc
		4.5E-03	i			4.5E-03	r	0	0.10		4685-14-7	Paraquat	2.9E+02	nc	3.1E+03	nc	1.6E+01	nc	1.6E+02	nc
		6.0E-03	h			6.0E-03	r	0	0.10		56-38-2	Parathion	3.9E+02	nc	4.1E+03	nc	2.2E+01	nc	2.2E+02	nc
		5.0E-02	h			5.0E-02	r	0	0.10		1114-71-2	Pebulate	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
		4.0E-02	i			4.0E-02	r	0	0.10		40487-42-1	Pendimethalin	2.6E+03	nc	2.7E+04	nc	1.0E+09	nc	1.5E+03	nc
2.3E-02	h			2.3E-02	r			0	0.10		87-84-3	Pentabromo-6-chloro cyclohexane	1.9E+01	ca	8.3E+01	ca	2.9E-01	ca	2.9E+00	ca
		2.0E-03	i			2.0E-03	r	0	0.10		1163-19-5	Pentabromodiphenyl ether	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
		8.0E-04	i			8.0E-04	r	0	0.10		608-93-5	Pentachlorobenzene	5.2E+01	nc	5.5E+02	nc	2.9E+00	nc	2.9E+01	nc
2.6E-01	h	3.0E-03	i	2.6E-01	r	3.0E-03	r	0	0.10		82-68-8	Pentachloronitrobenzene	1.7E+00	ca*	7.3E+00	ca	2.6E-02	ca	2.6E-01	ca
1.2E-01	i	3.0E-02	i	1.2E-01	r	3.0E-02	r	0	0.25		87-86-5	Pentachlorophenol	2.5E+00	ca	7.9E+00	ca	5.6E-02	ca	5.6E-01	ca
		5.0E-02	i			5.0E-02	r	0	0.10		52645-53-1	Permethrin	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
		2.5E-01	i			2.5E-01	r	0	0.10		13684-63-4	Phenmedipham	1.6E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc
		6.0E-01	i			6.0E-01	r	0	0.10		108-95-2	Phenol	3.9E+04	nc	1.0E+05	max	2.2E+03	nc	2.2E+04	nc
		6.0E-03	i			6.0E-03	r	0	0.10		108-45-2	m-Phenylenediamine	3.9E+02	nc	4.1E+03	nc	2.2E+01	nc	2.2E+02	nc
		1.9E-01	h			1.9E-01	r	0	0.10		106-50-3	p-Phenylenediamine	1.2E+04	nc	1.0E+05	max	6.9E+02	nc	6.9E+03	nc
		8.0E-05	i			8.0E-05	r	0	0.10		62-38-4	Phenylmercuric acetate	5.2E+00	nc	5.5E+01	nc	2.9E-01	nc	2.9E+00	nc
1.9E-03	h			1.9E-03	r			0	0.10		90-43-7	2-Phenylphenol	2.3E+02	ca	9.8E+02	ca	3.5E+00	ca	3.5E+01	ca
		2.0E-04	h			2.0E-04	r	0	0.10		298-02-2	Phorate	1.3E+01	nc	1.4E+02	nc	7.3E-01	nc	7.3E+00	nc
		2.0E-02	i			2.0E-02	r	0	0.10		732-11-6	Phosmet	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		3.0E-04	h			8.6E-06	h	0	0.10		7803-51-2	Phosphine	2.0E+01	nc	2.0E+02	nc	3.1E-02	nc	1.1E+01	nc
		2.0E-05	i			2.0E-05	r	0	0.10		7723-14-0	Phosphorus (white)					7.3E-02	nc		
		1.0E+00	h			1.0E+00	r	0	0.10		100-21-0	p-Phthalic acid					3.7E+03	nc		
		2.0E+00	i			3.4E-02	h	0	0.10		85-44-9	Phthalic anhydride					1.2E+02	nc		
		7.0E-02	i			7.0E-02	r	0	0.10		1918-02-1	Picloram	4.6E+03	nc	4.8E+04	nc	2.6E+02	nc	2.6E+03	nc
		1.0E-02	i			1.0E-02	r	0	0.10		23505-41-1	Pirimiphos-methyl	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
8.9E+00	h	7.0E-06	h	8.9E+00	r	7.0E-06	r	0	0.10		13336-36-3	Polybrominated biphenyls	5.0E-02	ca**	2.1E-01	ca*	7.6E-04	ca*	7.6E-03	ca*
7.7E+00	i			7.7E+00	r			0	0.06		1336-36-3	Polychlorinated biphenyls (PCBs)	6.6E-02	ca	3.4E-01	ca	8.7E-04	ca	8.7E-03	ca
		7.0E-05	i			7.0E-05	r	0	0.06		12674-11-2	Aroclor 1016	4.9E+00	nc	6.5E+01	nc	2.6E-01	nc	2.6E+00	nc
		2.0E-05	i			2.0E-05	r	0	0.06		11097-69-1	Aroclor 1254	1.4E+00	nc	1.9E+01	nc	7.3E-02	nc	7.3E-01	nc
									0.10			Polynuclear aromatic hydrocarbons								
		6.0E-02	i			6.0E-02	r	1	0.10	1.4E+05	83-32-9	Acenaphthene	3.6E+02	sat	3.6E+02	sat	2.2E+02	nc	3.7E+02	nc
		3.0E-01	i			3.0E-01	r	1	0.10	1.5E+06	120-12-7	Anthracene	1.9E+01	sat	1.9E+01	sat	1.1E+03	nc	1.8E+03	nc
7.3E-01	e			7.3E-01	r			0	0.10		56-55-3	Benz[a]anthracene	6.1E-01	ca	2.6E+00	ca	9.2E-03	ca	9.2E-02	ca
7.3E-01	e			7.3E-01	r			0	0.10		205-99-2	Benzo[b]fluoranthene	6.1E-01	ca	2.6E+00	ca	9.2E-03	ca	9.2E-02	ca
7.3E-02	e			7.3E-02	r			0	0.10		207-08-9	Benzo[k]fluoranthene	6.1E+00	ca	2.6E+01	ca	9.2E-02	ca	9.2E-01	ca
												"CAL-Modified PRG" (PEA, 1994)	6.1E-01							
7.3E+00	i			7.3E+00	r			0	0.10		50-32-8	Benzo[a]pyrene	6.1E-02	ca	2.6E-01	ca	9.2E-04	ca	9.2E-03	ca
												"CAL-Modified PRG" (PEA, 1994)							1.5E-03	

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FOR PLANNING PURPOSES

TOXICITY VALUES						SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF		oRfD		iSF		iRfD		V O C	skin ABS	VF	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
1/(mg/kg-d)		(mg/kg-d)		1/(mg/kg-d)		(mg/kg-d)				(m^3/kg)										
7.3E-03	e			7.3E-03	r			0	0.10	3.8E+07	218-01-9	Chrysene	2.4E+01	sat	2.4E+01	sat	9.2E-01	ca	9.2E+00	ca
												"CAL-Modified PRG" (PEA, 1994)	6.1E+00							
7.3E+00	e			7.3E+00	r			0	0.10		53-70-3	Dibenz[ah]anthracene	6.1E-02	ca	2.6E-01	ca	9.2E-04	ca	9.2E-03	ca
		4.0E-02	i			4.0E-02	r	0	0.10		206-44-0	Fluoranthene	2.6E+03	nc	2.7E+04	nc	1.5E+02	nc	1.5E+03	nc
		4.0E-02	i			4.0E-02	r	1	0.10	7.6E+05	86-73-7	Fluorene	3.0E+02	sat	3.0E+02	sat	1.5E+02	nc	2.4E+02	nc
7.3E-01	e			7.3E-01	r			0	0.10		193-39-5	Indeno[1,2,3-cd]pyrene	6.1E-01	ca	2.6E+00	ca	9.2E-03	ca	9.2E-02	ca
		4.0E-02	e			4.0E-02	r	1	0.10	7.1E+04	91-20-3	Naphthalene	8.0E+02	sat	8.0E+02	sat	1.5E+02	nc	2.4E+02	nc
		3.0E-02	i			3.0E-02	r	0	0.10		129-00-0	Pyrene	2.0E+03	nc	2.0E+04	nc	1.1E+02	nc	1.1E+03	nc
1.5E-01	i	9.0E-03	i	1.5E-01	r	9.0E-03	r	0	0.10		67747-09-5	Prochloraz	3.0E+00	ca	1.3E+01	ca	4.5E-02	ca	3.3E+02	ca
		6.0E-03	h			6.0E-03	r	0	0.10		26399-36-0	Profluralin	3.9E+02	nc	4.1E+03	nc	2.2E+01	nc	2.2E+02	nc
		1.5E-02	i			1.5E-02	r	0	0.10		1610-18-0	Prometon	9.8E+02	nc	1.0E+04	nc	5.5E+01	nc	5.5E+02	nc
		4.0E-03	i			4.0E-03	r	0	0.10		7287-19-6	Prometryn	2.6E+02	nc	2.7E+03	nc	1.5E+01	nc	1.5E+02	nc
		7.5E-02	i			7.5E-02	r	0	0.10		23950-58-5	Pronamide	4.9E+03	nc	5.1E+04	nc	2.7E+02	nc	2.7E+03	nc
		1.3E-02	i			1.3E-02	r	0	0.10		1918-16-7	Propachlor	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc
		5.0E-03	i			5.0E-03	r	0	0.10		709-98-8	Propanil	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		2.0E-02	i			2.0E-02	r	0	0.10		2312-35-8	Propargite	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		2.0E-03	i			2.0E-03	r	0	0.10		107-19-7	Propargyl alcohol	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc
		2.0E-02	i			2.0E-02	r	0	0.10		139-40-2	Propazine	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		2.0E-02	i			2.0E-02	r	0	0.10		122-49-9	Propham	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		1.3E-02	i			1.3E-02	r	0	0.10		60207-90-1	Propiconazole	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc
		2.0E+01	h			2.0E+01	r	0	0.10		57-55-6	Propylene glycol	1.0E+05	max	1.0E+05	max	7.3E+04	nc	7.3E+05	nc
		7.0E-01	h			7.0E-01	r	0	0.10		111-35-3	Propylene glycol, monoethyl ether	4.6E+04	nc	1.0E+05	max	2.6E+03	nc	2.6E+04	nc
		7.0E-01	h			5.7E-01	i	0	0.10		107-98-2	Propylene glycol, monomethyl ether	4.6E+04	nc	1.0E+05	max	2.1E+03	nc	2.6E+04	nc
2.4E-01	i	8.6E-03	r	1.3E-02	i	8.6E-03	i	1	0.10		75-56-9	Propylene oxide					5.2E-01	ca	2.2E-01	ca
		2.5E-01	i			2.5E-01	r	0	0.10		81335-77-5	Pursuit	1.6E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc
		2.5E-02	i			2.5E-02	r	0	0.10		51630-58-1	Pydrin	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc
		1.0E-03	i			1.0E-03	r	0	0.10		110-86-1	Pyridine	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc
		5.0E-04	i			5.0E-04	r	0	0.10		13593-03-8	Quinalphos	3.3E+01	nc	3.4E+02	nc	1.8E+00	nc	1.8E+01	nc
1.2E+01	h			1.2E+01	r			0	0.10		91-22-5	Quinoline	3.7E-02	ca	1.6E-01	ca	5.6E-04	ca	5.6E-03	ca
1.1E-01	i	3.0E-03	i	1.1E-01	r	3.0E-03	r	0	0.10		121-82-4	RDX (Cyclonite)	4.0E+00	ca	1.7E+01	ca	6.1E-02	ca	6.1E-01	ca
		3.0E-02	i			3.0E-02	r	0	0.10		10453-86-8	Resmethrin	2.0E+03	nc	2.0E+04	nc	1.1E+02	nc	1.1E+03	nc
		5.0E-02	h			5.0E-02	r	0	0.10		299-84-3	Ronnel	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc
		4.0E-03	i			4.0E-03	r	0	0.10		83-79-4	Rotenone	2.6E+02	nc	2.7E+03	nc	1.5E+01	nc	1.5E+02	nc
		2.5E-02	i			2.5E-02	r	0	0.10		78578-05-0	Savey	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc
		5.0E-03	i					0	0.10		7783-00-8	Selenious Acid	3.3E+02	nc	3.4E+03	nc			1.8E+02	nc
		5.0E-03	i					0	0.01		7782-49-2	Selenium	3.8E+02	nc	8.5E+03	nc			1.8E+02	nc
		5.0E-03	h					0	0.10		630-10-4	Selenourea	3.3E+02	nc	3.4E+03	nc			1.8E+02	nc
		9.0E-02	i			9.0E-02	r	0	0.10		74051-80-2	Sethoxydim	5.9E+03	nc	6.1E+04	nc	3.3E+02	nc	3.3E+03	nc
		5.0E-03	i					0	0.01		7440-22-4	Silver and compounds	3.8E+02	nc	8.5E+03	nc			1.8E+02	nc

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FOR PLANNING PURPOSES

TOXICITY VALUES							SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF 1/(mg/kg-d)		oRfD (mg/kg-d)		ISF 1/(mg/kg-d)		IRfD (mg/kg-d)		VOC	skin ABS	VF (m^3/kg)	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
1.2E-01	h	5.0E-03	I	1.2E-01	r	2.0E-03	r	0	0.10		122-34-9	Simazine	3.7E+00	ca*	1.6E+01	ca*	5.6E-02	ca	5.6E-01	ca
		4.0E-03	I			4.0E-03	r	0	0.10		26628-22-8	Sodium azide	2.6E+02	nc	2.7E+03	nc	1.5E+01	nc	1.5E+02	nc
2.7E-01	h	3.0E-02	I	2.7E-01	r	3.0E-02	r	0	0.10		20624-25-3	Sodium diethyldithiocarbamate	1.6E+00	ca	7.1E+00	ca	2.5E-02	ca	2.5E-01	ca
		2.0E-05	I			2.0E-05	r	0	0.10		62-74-8	Sodium fluoroacetate	1.3E+00	nc	1.4E+01	nc	7.3E-02	nc	7.3E-01	nc
		1.0E-03	h			1.0E-03	r	0	0.10		13718-26-8	Sodium metavanadate	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc
		6.0E-01	I					0	0.01		7440-24-6	Strontium, stable	4.6E+04	nc	1.0E+05	max			2.2E+04	nc
		3.0E-04	I			3.0E-04	r	0	0.10		57-24-9	Strychnine	2.0E+01	nc	2.0E+02	nc	1.1E+00	nc	1.1E+01	nc
		2.0E-01	I			2.9E-01	I	1	0.10	2.8E+04	100-42-5	Styrene	2.2E+03	sat	2.2E+03	sat	1.1E+03	nc	1.6E+03	nc
		2.5E-02	I			2.5E-02	r	0	0.10		88671-89-0	Systhane	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc
1.5E+05	h			1.5E+05	h			0	0.03		1746-01-6	2,3,7,8-TCDD (dioxin)	3.8E-06	ca	2.4E-05	ca	4.5E-08	ca	4.5E-07	ca
		7.0E-02	I			7.0E-02	r	0	0.10		34014-18-1	Tebuthiuron	4.6E+03	nc	4.8E+04	nc	2.6E+02	nc	2.6E+03	nc
		2.0E-02	h			2.0E-02	r	0	0.10		3383-96-8	Temephos	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc
		1.3E-02	I			1.3E-02	r	0	0.10		5902-51-2	Terbacil	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc
		2.5E-05	h			2.5E-05	r	0	0.10		13071-79-9	Terbufos	1.6E+00	nc	1.7E+01	nc	9.1E-02	nc	9.1E-01	nc
		1.0E-03	I			1.0E-03	r	0	0.10		886-50-0	Terbutryn	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc
		3.0E-04	I			3.0E-04	r	0	0.10		95-94-3	1,2,4,5-Tetrachlorobenzene	2.0E+01	nc	2.0E+02	nc	1.1E+00	nc	1.1E+01	nc
2.6E-02	I	3.0E-02	I	2.6E-02	I	3.0E-02	r	1	0.10	2.6E+04	630-20-6	1,1,1,2-Tetrachloroethane	4.8E+00	ca	1.2E+01	ca	2.6E-01	ca	4.3E-01	ca
2.0E-01	I			2.0E-01	I			1	0.10	4.5E+04	79-34-5	1,1,2,2-Tetrachloroethane	9.0E-01	ca	2.4E+00	ca	3.3E-02	ca	5.5E-02	ca
5.2E-02	e	1.0E-02	I	2.0E-03	e	1.0E-02	r	1	0.10	1.2E+04	127-18-4	Tetrachloroethylene (PCE)	7.0E+00	ca	2.5E+01	ca	3.3E+00	ca	1.1E+00	ca
												"CAL-Modified PRG" (PEA, 1994)					3.2E-01			
		3.0E-02	I			3.0E-02	r	0	0.10		58-90-2	2,3,4,6-Tetrachlorophenol	2.0E+03	nc	2.0E+04	nc	1.1E+02	nc	1.1E+03	nc
2.0E+01	h			2.0E+01	r			0	0.10		5216-25-1	p,a,a,a-Tetrachlorotoluene	2.2E-02	ca	9.5E-02	ca	3.4E-04	ca	3.4E-03	ca
2.4E-02	h	3.0E-02	I	2.4E-02	r	3.0E-02	r	0	0.10		22248-79-9	Tetrachlorovinphos	1.9E+01	ca	7.9E+01	ca	2.8E-01	ca	2.8E+00	ca
		5.0E-04	I			5.0E-04	r	0	0.10		3689-24-5	Tetraethyldithiopyrophosphate	3.3E+01	nc	3.4E+02	nc	1.8E+00	nc	1.8E+01	nc
		7.0E-05	h					0	0.01		1314-12-1	Thallic oxide	5.4E+00	nc	1.2E+02	nc			2.6E+00	nc
		9.0E-05	I					0	0.01		563-68-8	Thallium acetate	6.9E+00	nc	1.5E+02	nc			3.3E+00	nc
		8.0E-05	I					0	0.01		6533-73-9	Thallium carbonate	6.1E+00	nc	1.4E+02	nc			2.9E+00	nc
		8.0E-05	I					0	0.01		7791-12-0	Thallium chloride	6.1E+00	nc	1.4E+02	nc			2.9E+00	nc
		9.0E-05	I					0	0.01		10102-45-1	Thallium nitrate	6.9E+00	nc	1.5E+02	nc			3.3E+00	nc
		9.0E-05	x					0	0.01		12039-52-0	Thallium selenite	6.9E+00	nc	1.5E+02	nc			3.3E+00	nc
		8.0E-05	I					0	0.01		7446-18-6	Thallium sulfate	6.1E+00	nc	1.4E+02	nc			2.9E+00	nc
		1.0E-02	I			1.0E-02	r	0	0.10		28249-77-6	Thiobencarb	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
		3.0E-02	x			3.0E-02	r	0	0.10		3689-24-5	2-(Thiocyanomethylthio)- benzothiazole (TC	2.0E+03	nc	2.0E+04	nc	1.1E+02	nc	1.1E+03	nc
		3.0E-04	h			3.0E-04	r	0	0.10		39196-18-4	Thiofanox	2.0E+01	nc	2.0E+02	nc	1.1E+00	nc	1.1E+01	nc
		8.0E-02	I			8.0E-02	r	0	0.10		23564-05-8	Thiophanate-methyl	5.2E+03	nc	5.5E+04	nc	2.9E+02	nc	2.9E+03	nc
		5.0E-03	I			5.0E-03	r	0	0.10		137-26-8	Thiram	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		6.0E-01	h					0	0.01		n/a	Tin and compounds	4.6E+04	nc	1.0E+05	max			2.2E+04	nc
		2.0E-01	I			1.1E-01	h	1	0.10	1.3E+04	108-88-3	Toluene	1.9E+03	nc	2.7E+03	sat	4.0E+02	nc	7.2E+02	nc
3.2E+00	h			3.2E+00	r			0	0.10		95-80-7	Toluene-2,4-diamine	1.4E-01	ca	6.0E-01	ca	2.1E-03	ca	2.1E-02	ca

Key : I=IRIS h=HEAST e=ECAO x=WITHDRAWN r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(nc < 100X ca) **(nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY VALUES							SOIL FACTORS				CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs)							
oSF 1/(mg/kg-d)		oRfD (mg/kg-d)		iSF 1/(mg/kg-d)		IRfD (mg/kg-d)		V O C	skin ABS	VF (m^3/kg)	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)	
		6.0E-01	h			6.0E-01	r	0	0.10		95-70-5	Toluene-2,5-diamine	3.9E+04	nc	1.0E+05	max	2.2E+03	nc	2.2E+04	nc
		2.0E-01	h			2.0E-01	r	0	0.10		823-40-5	Toluene-2,6-diamine	1.3E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc
1.9E-01	i			1.9E-01	r			0	0.10		106-49-0	p-Toluidine	2.3E+00	ca	1.0E+01	ca	3.5E-02	ca	3.5E-01	ca
1.1E+00	i			1.1E+00	i			0	0.10		8001-35-2	Toxaphene	4.0E-01	ca	1.7E+00	ca	6.0E-03	ca	6.1E-02	ca
		7.5E-03	i			7.5E-03	r	0	0.10		66841-25-6	Tralomethrin	4.9E+02	nc	5.1E+03	nc	2.7E+01	nc	2.7E+02	nc
		1.3E-02	i			1.3E-02	r	0	0.10		2303-17-5	Triallate	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc
		1.0E-02	i			1.0E-02	r	0	0.10		82097-50-5	Triasulfuron	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
		5.0E-03	i			5.0E-03	r	0	0.10		615-54-3	1,2,4-Tribromobenzene	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc
		3.0E-05	i			3.0E-05	r	0	0.10		56-35-9	Tributyltin oxide (TBTO)	2.0E+00	nc	2.0E+01	nc	1.1E-01	nc	1.1E+00	nc
3.4E-02	h			3.4E-02	r			0	0.10		634-93-5	2,4,6-Trichloroaniline	1.3E+01	ca	5.6E+01	ca	2.0E-01	ca	2.0E+00	ca
2.9E-02	h			2.9E-02	r			0	0.10		33663-50-2	2,4,6-Trichloroaniline hydrochloride	1.5E+01	ca	6.6E+01	ca	2.3E-01	ca	2.3E+00	ca
		1.0E-02	i			5.7E-02	h	1	0.10	1.5E+05	120-82-1	1,2,4-Trichlorobenzene	6.2E+02	nc	5.9E+03	nc	2.1E+02	nc	1.9E+02	nc
		9.0E-02	h			2.9E-01	x	1	0.10	1.5E+04	71-55-6	1,1,1-Trichloroethane	3.2E+03	nc	3.0E+03	sat	1.0E+03	nc	1.3E+03	nc
5.7E-02	i	4.0E-03	i	5.6E-02	i	4.0E-03	r	1	0.10	1.4E+04	79-00-5	1,1,2-Trichloroethane	1.4E+00	ca	3.3E+00	ca	1.2E-01	ca	2.0E-01	ca
1.1E-02	e	6.0E-03	e	6.0E-03	e	6.0E-03	r	1	0.10	7.6E+03	79-01-6	Trichloroethylene (TCE)	7.1E+00	ca*	1.7E+01	ca*	1.1E+00	ca*	1.6E+00	ca*
		3.0E-01	i			2.0E-01	h	1	0.10	2.3E+03	75-69-4	Trichlorofluoromethane	7.1E+02	nc	2.4E+03	nc	7.3E+02	nc	1.3E+03	nc
		1.0E-01	i			1.0E-01	r	0	0.10		95-95-4	2,4,5-Trichlorophenol	6.5E+03	nc	6.8E+04	nc	3.7E+02	nc	3.7E+03	nc
1.1E-02	i			1.1E-02	i			0	0.10		88-06-2	2,4,6-Trichlorophenol	4.0E+01	ca	1.7E+02	ca	6.2E-01	ca	6.1E+00	ca
		1.0E-02	i			1.0E-02	r	0	0.10		93-76-5	2,4,5-Trichlorophenoxyacetic Acid	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
		8.0E-03	i			8.0E-03	r	0	0.10		93-72-1	2-(2,4,5-Trichlorophenoxy) propionic acid	5.2E+02	nc	5.5E+03	nc	2.9E+01	nc	2.9E+02	nc
		5.0E-03	i			5.0E-03	r	1	0.10	7.7E+03	598-77-6	1,1,2-Trichloropropane	5.1E+01	nc	1.9E+02	nc	1.8E+01	nc	3.0E+01	nc
7.0E+00	h	6.0E-03	i	7.0E+00	r	5.0E-03	r	1	0.10	7.7E+03	96-18-4	1,2,3-Trichloropropane	6.6E-03	ca	1.5E-02	ca	9.6E-04	ca	3.1E+01	ca
		5.0E-03	h			5.0E-03	r	1	0.10	1.2E+04	96-19-5	1,2,3-Trichloropropene	7.5E+01	nc	2.9E+02	nc	1.8E+01	nc	3.0E+01	nc
		3.0E+01	i			8.6E+00	h	1	0.10	3.1E+03	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.6E+03	sat	3.6E+03	sat	3.1E+04	nc	5.9E+04	nc
		3.0E-03	i			3.0E-03	r	0	0.10		58138-08-2	Tridiphane	2.0E+02	nc	2.0E+03	nc	1.1E+01	nc	1.1E+02	nc
		2.0E-03	r			2.0E-03	i	1	0.10	8.3E+03	121-44-8	Triethylamine	2.2E+01	nc	8.0E+01	nc	7.3E+00	nc	1.2E+01	nc
7.7E-03	i	7.5E-03	i	7.7E-03	r	7.5E-03	r	0	0.10		1582-09-8	Trifluralin	5.8E+01	ca**	2.5E+02	ca*	8.7E-01	ca*	8.7E+00	ca*
3.7E-02	h			3.7E-02	r			0	0.10		512-56-1	Trimethyl phosphate	1.2E+01	ca	5.2E+01	ca	1.8E-01	ca	1.8E+00	ca
		5.0E-05	i			5.0E-05	r	0	0.10		99-35-4	1,3,5-Trinitrobenzene	3.3E+00	nc	3.4E+01	nc	1.8E-01	nc	1.8E+00	nc
		1.0E-02	h			1.0E-02	r	0	0.10		479-45-8	Trinitrophenylmethylnitramine	6.5E+02	nc	6.8E+03	nc	3.7E+01	nc	3.7E+02	nc
3.0E-02	i	5.0E-04	i	3.0E-02	r	5.0E-04	r	0	0.10		118-96-7	2,4,6-Trinitrotoluene	4.8E+01	ca	6.4E+01	ca	2.2E-01	ca	2.2E+00	ca
		3.0E-03	i					0	0.01		7440-61-1	Uranium (soluble salts)	2.3E+02	nc	5.1E+03	nc			1.1E+02	nc
		7.0E-03	h					0	0.01		7440-62-2	Vanadium	5.4E+02	nc	1.2E+04	nc			2.6E+02	nc
		9.0E-03	i					0	0.01		1314-62-1	Vanadium pentoxide	6.9E+02	nc	1.5E+04	nc			3.3E+02	nc
		2.0E-02	h					0	0.01		27774-13-6	Vanadyl sulfate	1.5E+03	nc	3.4E+04	nc			7.3E+02	nc
		2.0E-02	h					0	0.01		13701-70-7	Vanadium sulfate	1.5E+03	nc	3.4E+04	nc			7.3E+02	nc
		1.0E-03	i			1.0E-03	r	0	0.10		1929-77-7	Vernam	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc
		2.5E-02	i			2.5E-02	r	0	0.10		50471-44-8	Vinclozolin	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc
		1.0E+00	h			5.7E-02	i	0	0.10		108-05-4	Vinyl acetate	6.5E+04	nc	1.0E+05	max	2.1E+02	nc	3.7E+04	nc